

Service Manual

AV Control Stereo Receiver

Receiver

SA-GX180



Colour

(K)...Black Type

Areas

Suffix for Model No.	Area	Colour
(E)	Europe.	(K)
(EG)	Germany and Italy.	

Please file and use this manual together with the service manual for Model No. SA-GX280, Order No. MD9505058C2.

Note: • This service manual is provided to indicate the main differences between the original model No. SA-GX280 (E) and the subsequent model No. SA-GX180 (E, EG).

CHANGES

SPECIFICATIONS

SA-GX280 (E)

■ AMPLIFIER SECTION

Power output (at 240 V)	
DIN 1 kHz (T.H.D. 1%)	2 × 80 W (4 Ω)
40 Hz–20 kHz continuous power output both channels driven	2 × 60 W (8 Ω)
Input sensitivity and impedance	
CD, VCR 1, VCR 2, TAPE/DCC	200 mV/22 kΩ
S/N at rated power (8 Ω)	
CD, VCR 1, VCR 2, TAPE/DCC	80 dB (IHF, A: 90 dB)
Frequency response	
CD, VCR 1, VCR 2, TAPE/DCC	10 Hz–40 kHz, ±3 dB
Output voltage	
VCR 1 OUT, TAPE/DCC REC (OUT)	200 mV

■ GENERAL

Power consumption	160 W
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SA-GX180 (E, EG)

■ AMPLIFIER SECTION

Power output (at 240 V)	
DIN 1 kHz (T.H.D. 1%)	2 × 60 W (4 Ω)
40 Hz–20 kHz continuous power output both channels driven	2 × 40 W (8 Ω)
Input sensitivity and impedance	
CD, VCR 1, TAPE/VCR 2/DCC	200 mV/22 kΩ
S/N at rated power (8 Ω)	
CD, VCR 1, TAPE/VCR 2/DCC	80 dB (IHF, A: 90 dB)
Frequency response	
CD, VCR 1, TAPE/VCR 2/DCC	10 Hz–40 kHz, ±3 dB
Output voltage	
VCR 1 OUT, TAPE/VCR 2/DCC REC (OUT)	200 mV

■ GENERAL

Power consumption	170 W
-------------------	-------

⚠ WARNING

This service information is designed for experienced repair technicians only and is not designed for use by the general public. It does not contain warnings or cautions to advise non-technical individuals of potential dangers in attempting to service a product. Products powered by electricity should be serviced or repaired only by experienced professional technicians. Any attempt to service or repair the product or products dealt with in this service information by anyone else could result in serious injury or death.

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CHANGE IN REPLACEMENT PARTS LIST

(SA-GX280 Service Manual of pages 38~43.)

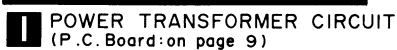
- Notes:**
- Mentioned in this parts list is only those different from Model No. SA-GX280 (E).
All other parts are the same as for SA-GX280 (E).
 - Important safety notice:
Components identified by $\triangle$ mark have special characteristics important for safety.
Furthermore, special parts which have purposes of fire-retardant (resistors), high-quality sound (capacitors), low-noise (resistors), etc. are used.
When replacing any of components, be sure to use only manufacturer's specified parts shown in the parts list.
 - [M] Indicates In Remarks columns parts that are supplied by MESA.

Ref. No.	Change of Part No.		Part Name & Description	Remarks
	SA-GX280 (E)	SA-GX180 (E, EG)		
INTEGRATED CIRCUIT(S)				
IC601	RSN3306A	SVI3205B	POWER AMP.	△
TRANSISTOR(S)				
Q191～193	2SC3311AR	2SC3311AR	TRANSISTOR	(E)
		—	TRANSISTOR	(EG) Deletion
Q603	—	2SC3311AR	TRANSISTOR	Addition
DIODE(S)				
D605, 606	SB360L6508	—	DIODE	Deletion
D721～724	P300DLF	—	DIODE	△ Deletion
D932	MA165	MA165	DIODE	(E)
		—	DIODE	(EG) Deletion
D933	MA165	—	DIODE	Deletion
COIL(S)				
L101	ELESNR68MA	ELESNR68MA	COIL	(E)
		ELESN1R0MA	COIL	(EG)
L191	ELESNR68MA	ELESNR68MA	COIL	(E)
		ELESNR56MA	COIL	(EG)
TRANSFORMER(S)				
T701	RTP1N5E014-V	RTP1N5E021-V	POWER TRANSFORMER (MAIN)	[M] △
COMPONENT COMBINATION(S)				
Z101	RLA6Z005M-T	RLA6Z005M-T	COMPONENT COMBINATION	(E)
		RLA2Z002M-T	COMPONENT COMBINATION	(EG)
SWITCH(ES)				
S951	EVQ21405R	—	VCR2	Deletion
CONNECTOR(S) AND SOCKET(S)				
CN301	RJS1A6603	—	CONNECTOR (3P)	Deletion
CN715, 716	RJS1A1101T1	—	CONNECTOR (1P)	Deletion
JACK(S) AND TERMINAL(S)				
JK301	SJFK5-1	—	VCR 2 IN TERMINAL	Deletion
JK302	SJFD7-6	—	VCR 2 OUT TERMINAL	Deletion
RESISTORS				
R145, 146	ERDS2TJ102	ERDS2TJ102	1/4W 1KΩ	(E)
		ERDS2TJ561	1/4W 560Ω	(EG)
R191	ERDS2TJ103	ERDS2TJ103	1/4W 10KΩ	(E)
		—	—	(EG) Deletion
R192	ERDS2TJ122	ERDS2TJ122	1/4W 1.2KΩ	(E)
		—	—	(EG) Deletion

Ref. No.	Change of Part No.		Part Name & Description		Remarks
	SA-GX280 (E)	SA-GX180 (E, EG)			
R193	ERDS2TJ182	ERDS2TJ182	1/4W	1.8KΩ	(E)
		—	—	(EG) Deletion	
R194	ERDS2TJ122	ERDS2TJ122	1/4W	1.2KΩ	(E)
		—	—	(EG) Deletion	
R195	ERDS2TJ222	ERDS2TJ222	1/4W	2.2KΩ	(E)
		—	—	(EG) Deletion	
R375, 376	ERDS2TJ102	—	1/4W	1KΩ	Deletion
R377, 378	ERDS2TJ223	—	1/4W	22KΩ	Deletion
R609, 610	ERDS2TJ100	ERDS2TJ470	1/4W	47Ω	
R613, 614	ERDS2TJ102	—	1/4W	1KΩ	Deletion
R615	ERDS2TJ184T	—	1/4W	180KΩ	Deletion
R616	ERDS2TJ154	—	1/4W	150KΩ	Deletion
R621, 622	ERD25FVJ180T	—	1/4W	18Ω	△ Deletion
R624	ERDS2TJ224T	—	1/4W	220KΩ	Deletion
R626	ERDS2TJ473	—	1/4W	47KΩ	Deletion
R643	ERDS2TJ154	—	1/4W	150KΩ	Deletion
R644	ERDS2TJ154	ERDS2TJ473	1/4W	47KΩ	
R645	ERDS2TJ183T	—	1/4W	18KΩ	Deletion
R678	—	ERDS2TJ683	1/4W	68KΩ	Addition
R680	—	ERDS2TJ104	1/4W	100KΩ	Addition
R705	ERDS1FVJ6R8T	ERD2FCVJ4R7T	1/4W	4.7Ω	△
CAPACITORS					
C108	ECBT1H100JC5	ECBT1H100JC5	50V	10pF	(E)
		ECBT1H8R2KC5	50V	8.2pF	(EG)
C375, 376	ECBT1H221KB5	—	50V	220pF	Deletion
C377, 378	ECBT1H821KB5	—	50V	820pF	Deletion
C609, 610	ECBT1H151KB5	ECBA1H681KB5	50V	680pF	
C613, 614	ECBA1H681KB5	—	50V	680pF	Deletion
C615	ECEA2AN2R2SB	ECEA2AU100	100V	10μF	
C618	ECEA2AU100	—	100V	10μF	Deletion
C621	ECEA2AU100	ECEA2AN2R2SB	100V	2.2μF	
C705, 706	ECA1VM472B	—	35V	4700μF	△ Deletion
C722	ECQE2104KF3	—	250V	0.1μF	Deletion
CABINET AND CHASSIS					
5	RGR0178B-K1	RGR0178D-B1	REAR PANEL		[M] (E)
		RGR0178D-A	REAR PANEL		[M] (EG)
10	RWJ1803150QK	—	FLAT CABLE (3P) (W301)		Deletion
11	RFKEAGX170EK	—	CONNECTOR ASS'Y (3P) (W302)		Deletion
13	RFKGAGX280EK	RFKGAGX180EK	FRONT PANEL ASS'Y		[M]
18	RGU1057-K	RGU0991-K	SELECTOR BUTTON		
32	XTBS3+8JFZ1	—	SCREW		Deletion
33	XTBS26+8J	—	SCREW		Deletion
PACKING MATERIAL					
P1	RPG2584	RPG2583	PACKING CASE		[M]
ACCESSORIES					
A1	RFKSAGX180E	RFKSAGX180E	INSTRUCTION MANUAL ASS'Y		[M] (E)
		RFKSAGX180EG	INSTRUCTION MANUAL ASS'Y		[M] (EG)

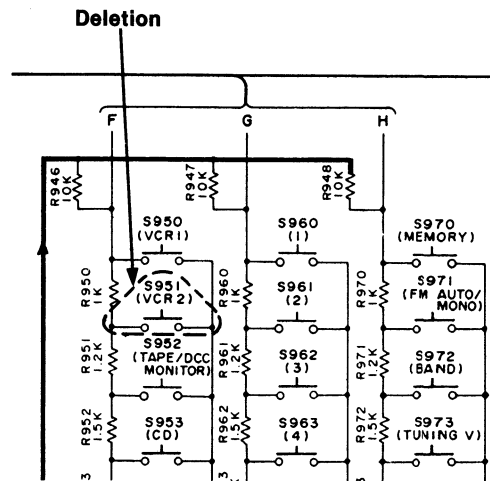
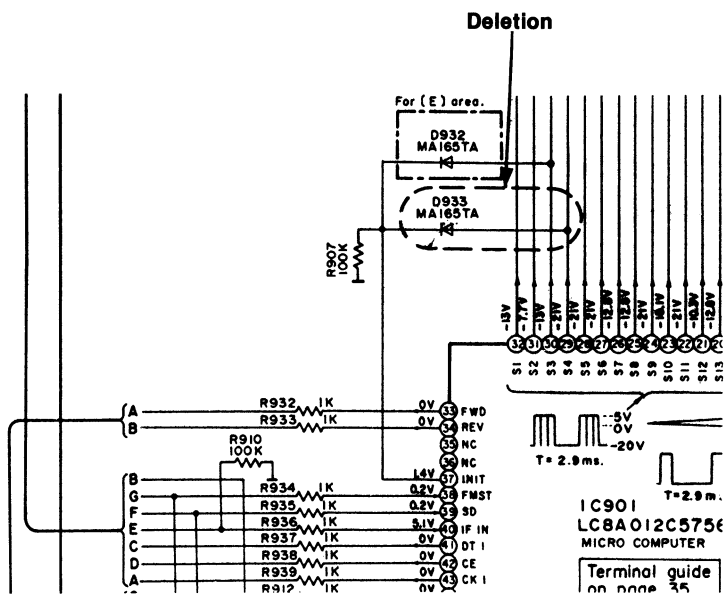
■ MAIN CIRCUIT (P.C.Board: on pages 8,9)



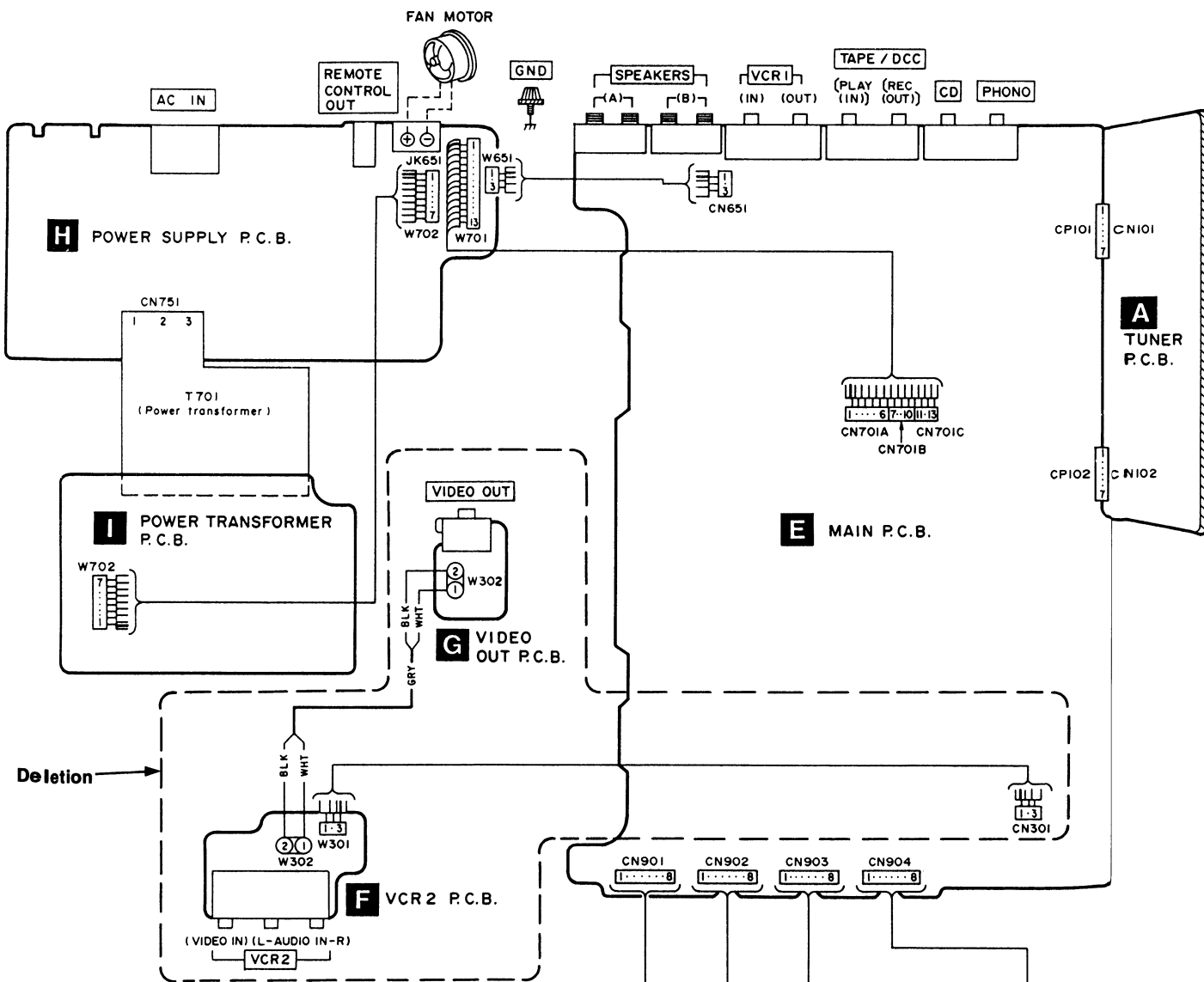


For (E) area.

For (EG) area.

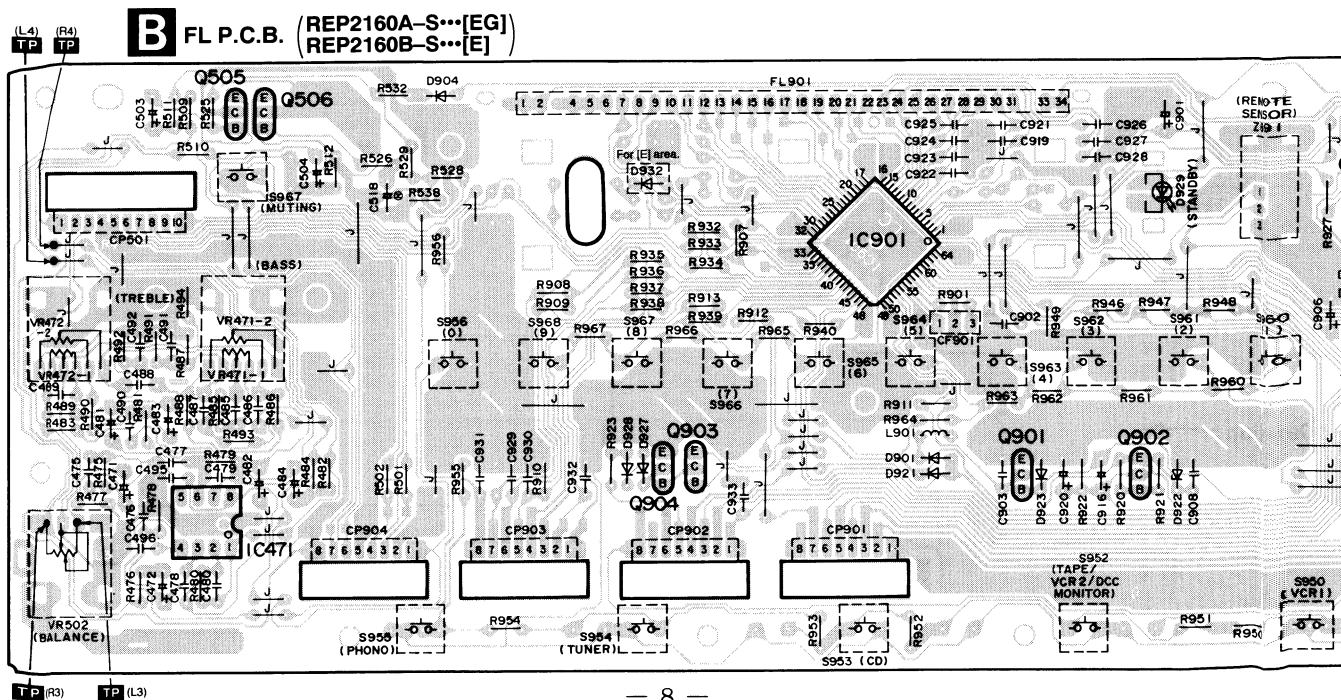
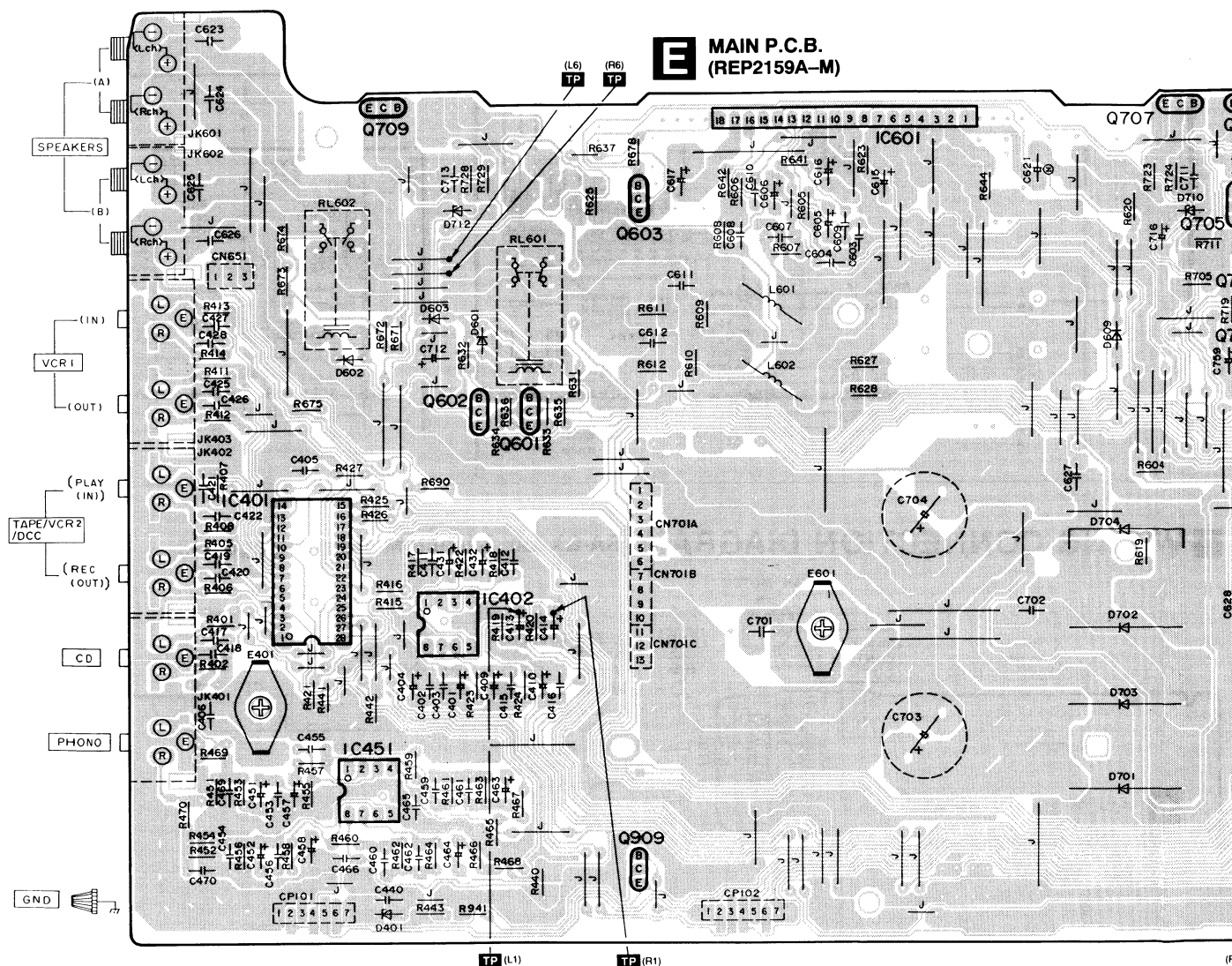
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■ WIRING CONNECTION DIAGRAM (SA-GX280 Service Manual of page 34.)

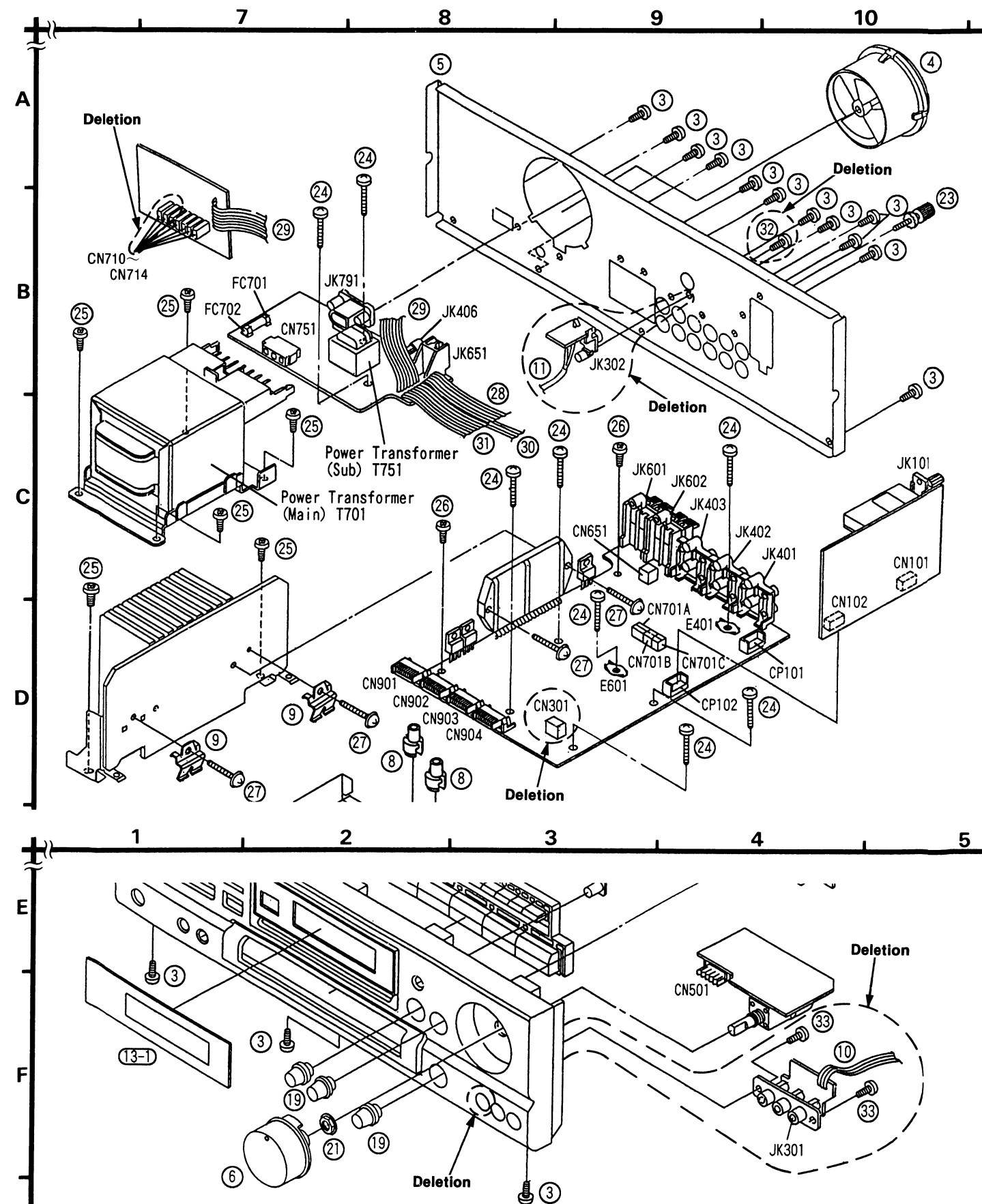


PRINTED CIRCUIT BOARDS (SA-GX280 Service Manual of pages 30~33.)

- Notes:**
- For printed circuit boards not specified in this Service Manual, refer to SA-GX280 (E) Order No. MD9505058C2.
 - This schematic diagram may be modified at any time with the development of new technology.



CABINET PARTS LOCATION (SA-GX280 Service Manual of pages 36, 37.)



Service Manual

AV Control Stereo Receiver

Receiver

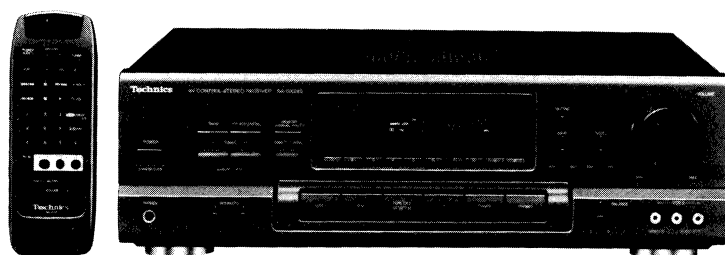
SA-GX280

Colour

(K) ... Black Type

Areas

Suffix for Model No.	Area	Colour
(E)	Europe.	(K)
(EG)	Germany and Italy.	



SPECIFICATIONS (DIN 45 500)

■ AMPLIFIER SECTION

Power output (at 240 V for (E) area.)	
DIN 1 kHz (T.H.D. 1%)	2 × 80 W (4 Ω)
40 Hz–20 kHz continuous power output both channels driven	2 × 60 W (8 Ω)
Total harmonic distortion	
rated power at 40 Hz–20 kHz	0.5% (8 Ω)
half power at 1 kHz	0.03% (8 Ω)
Intermodulation distortion	
rated power at 60 Hz: 7 kHz=4:1, SMPTE	0.5% (8 Ω)
Power bandwidth	
both channels driven, –3 dB	10 Hz–40 kHz (8 Ω)
Damping factor	40 (8 Ω)
Input sensitivity and impedance	
PHONO	3 mV/47 kΩ
CD, VCR 1, VCR 2, TAPE/DCC	200 mV/22 kΩ
S/N at rated power (8 Ω)	
PHONO	70 dB (IHF, A: 80 dB)
CD, VCR 1, VCR 2, TAPE/DCC	80 dB (IHF, A: 90 dB)
Frequency response	
PHONO	RIAA standard curve (30 Hz–15 kHz) ±0.8 dB
CD, VCR 1, VCR 2, TAPE/DCC	10 Hz–40 kHz, ±3 dB
Tone controls	
BASS	50 Hz, +10 to –10 dB
TREBLE	20 kHz, +10 to –10 dB
Output voltage	
VCR 1 OUT, TAPE/DCC REC (OUT)	200 mV
Channel balance (250 Hz–6.3 kHz)	±1 dB
Channel separation	55 dB
Headphones output level and impedance	430 mV/330 Ω
Load impedance	
A or B	4–16 Ω
A and B	8–16 Ω

■ FM TUNER SECTION

Frequency range	87.50–108.00 MHz
Sensitivity	
S/N 30 dB	1.5 μV/75 Ω
S/N 26 dB	1.3 μV/75 Ω
S/N 20 dB	1.2 μV/75 Ω
IHF usable sensitivity	(IHF '58) 1.5 μV/75 Ω
IHF 46 dB stereo quieting sensitivity	22 μV/75 Ω
Total harmonic distortion	
MONO	0.2%
STEREO	0.3%
S/N	
MONO	60 dB (75 dB, IHF)
STEREO	58 dB (71 dB, IHF)
Frequency response	20 Hz–15 kHz, +1 dB, –2 dB
Alternate channel selectivity	
±400 kHz	65 dB
Capture ratio	1.0 dB
Image rejection at 98 MHz	40 dB
IF rejection at 98 MHz	70 dB
Spurious response rejection at 98 MHz	70 dB
AM suppression	50 dB
Stereo separation	
1 kHz	40 dB
Carrier leak	
19 kHz	–30 dB (–35 dB, IHF)
38 kHz	–50 dB (–55 dB, IHF)
Channel balance (250 Hz–6.3 kHz)	±1.5 dB
Limiting point	1.2 μV
Bandwidth	
IF amplifier	180 kHz
FM demodulator	1000 kHz
Antenna terminal(s)	75 Ω (unbalanced)

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■ AM TUNER SECTION

• For (E) area.	
Frequency range	
MW	522 – 1611 kHz (9 kHz steps)
	530 – 1620 kHz (10 kHz steps)
LW	144 – 288 kHz
Sensitivity	
MW	20 µV, 300 µV/m
LW	45 µV
Selectivity	
MW (at 999 kHz)	55 dB
LW (at 252 kHz)	55 dB
Image rejection	
MW (at 999 kHz)	40 dB
LW (at 252 kHz)	40 dB
IF rejection	
MW (at 999 kHz)	55 dB
LW (at 252 kHz)	55 dB
• For (EG) area.	
Frequency range	522~1611 kHz (9 kHz steps)
	530~1620 kHz (10 kHz steps)
Sensitivity (S/N 20 dB)	20 µV, 330 µV/m
Selectivity at 999 kHz	55 dB
Image rejection at 999 kHz	40 dB
IF rejection at 999 kHz	55 dB

■ GENERAL

Power consumption	160 W
Power supply	
[For (E) area.]	AC 50/60 Hz, 230 – 240 V
[For (EG) area.]	AC 50/60 Hz, 230 V
Dimensions (W × H × D)	430 × 136 × 305 mm
Weight	6.6 kg

■ REMOTE CONTROL TRANSMITTER

Control keys	35 keys
Dimensions (W × H × D)	62 × 22.3 × 175 mm
Weight (including batteries)	111 g (3.9 oz)
Power source	Two UM-4
	(Panasonic R03/LR03 or equivalent)

Notes:

- Design and specifications are subject to change without notice.
Weight and dimensions are approximate.
- Total harmonic distortions is measured by the digital spectrum analyzer.

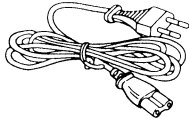
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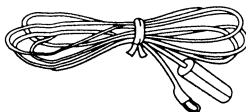
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■ ACCESSORIES

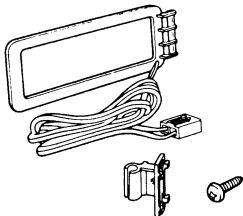
AC power supply cord..... 1 pc.
[RJA0019-2K]



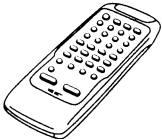
FM indoor antenna 1 pc.
(SSA270M)



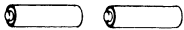
AM loop antenna set..... 1 pc.
(RSA0010)
• AM antenna holder..... 1 pc.
(RMN0244)
• Screw..... 1 pc.
(XTN3+12AFZ)



Remote control transmitter (1)
(EUR643861)

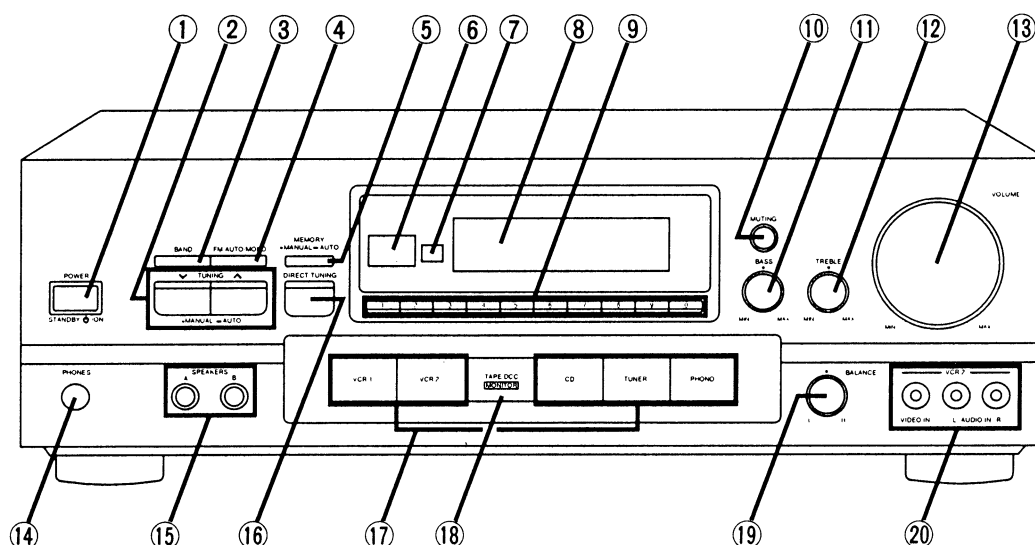


Batteries (2)
(UM-4, "AAA", R03)



Note: These are available on sale route.

FRONT PANEL CONTROLS

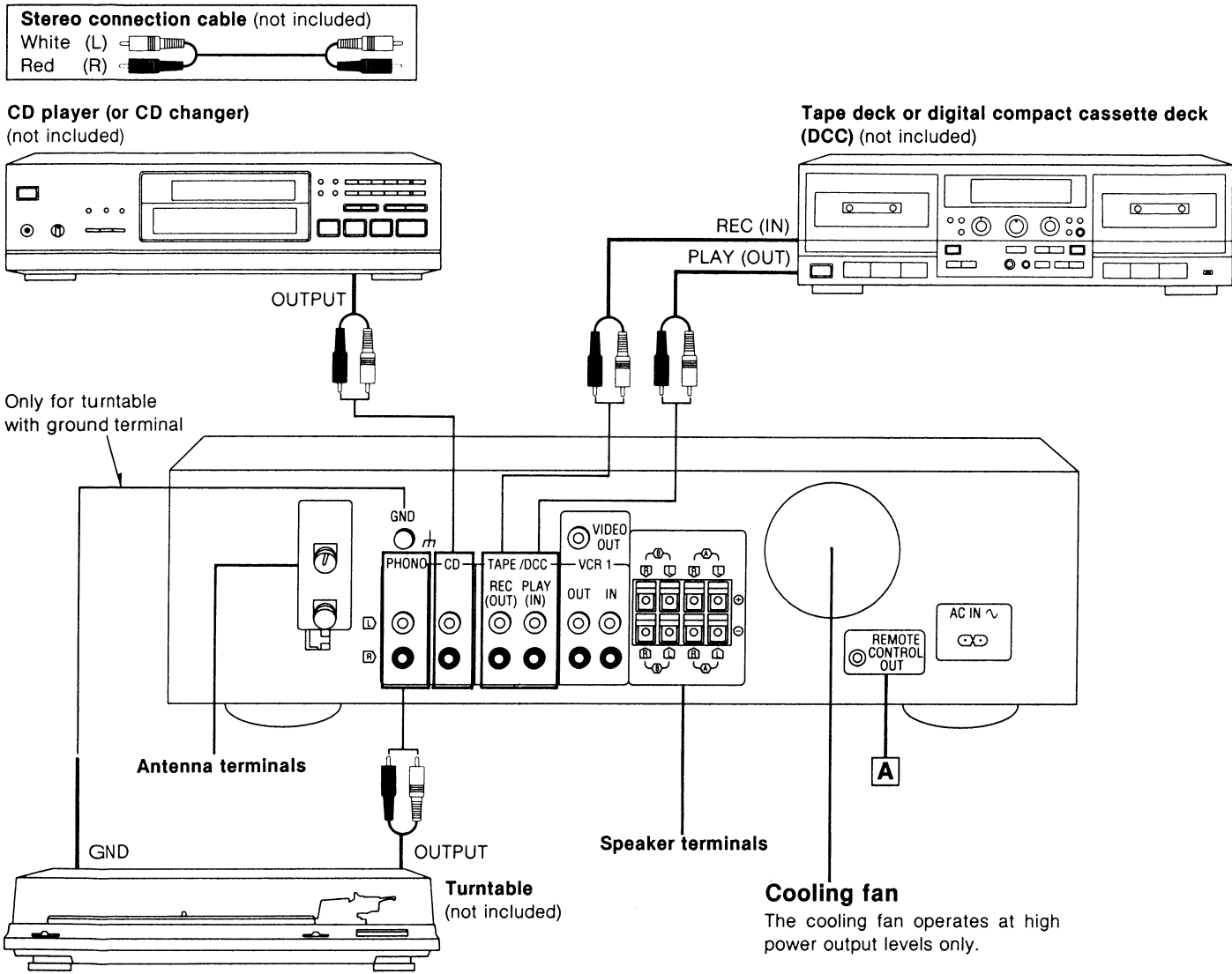


No.	Name
①	Power “STANDBY /ON” switch (POWER, STANDBY /ON) Press to switch the unit from on to standby mode or vice versa. In standby mode, the unit is still consuming a small amount of power.
②	Tuning buttons (TUNING)
③	Band select button (BAND)
④	FM mode select button (FM AUTO/MONO)
⑤	Memory button (MEMORY)
⑥	Remote control signal receptor (SENSOR)
⑦	“STANDBY” indicator When the unit is connected to the AC mains supply, this indicator lights up in standby mode and goes out when the unit is turned on.
⑧	Display
⑨	Numeric buttons (1 – 0)
⑩	Muting button (MUTING)

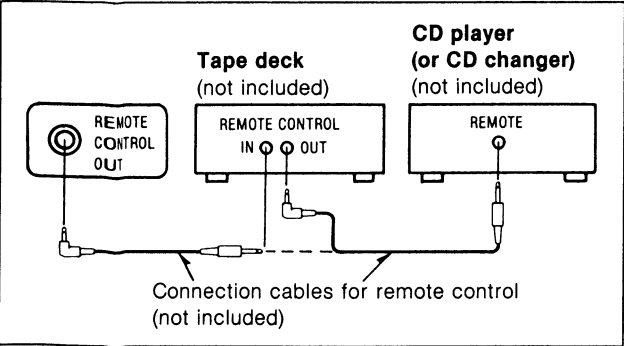
No.	Name
⑪	Bass control (BASS)
⑫	Treble control (TREBLE)
⑬	Volume control (VOLUME)
⑭	Headphone jack (PHONES)
⑮	Speaker select buttons (SPEAKERS)
⑯	Direct tuning button (DIRECT TUNING)
⑰	Input select buttons
⑱	Tape/DCC monitor button (TAPE/DCC)
⑲	Balance control (BALANCE)
⑳	VCR 2 input terminals (VCR 2)

EQUIPMENT CONNECTIONS

Connecting audio equipment

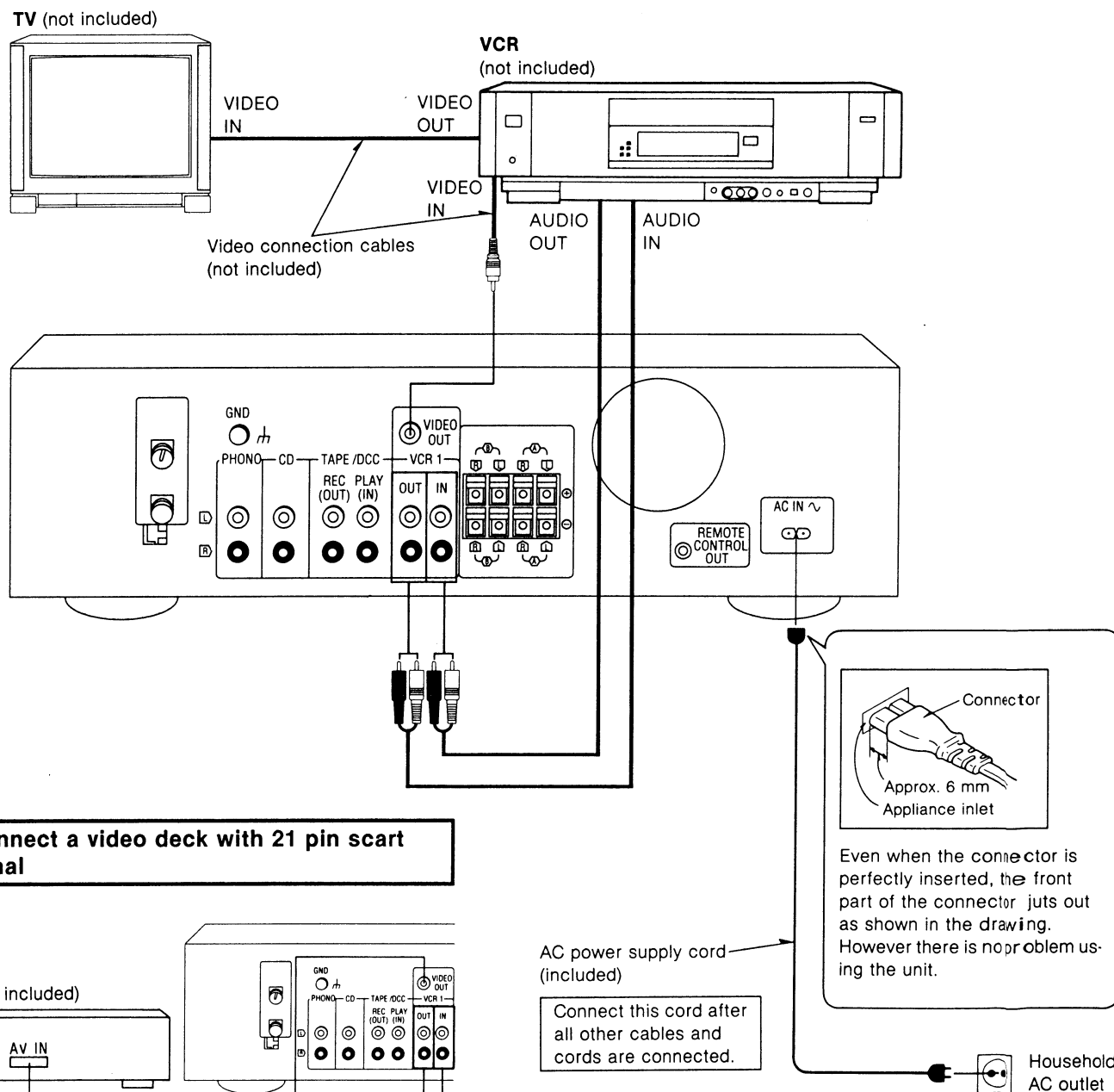


A “REMOTE CONTROL OUT” terminal
Connect the connection cable for the remote control to a Technics tape deck and/or CD player (or CD changer) which has the appropriate remote control terminal as shown below. If a tape deck is not being used, the CD player (or CD changer) can be connected directly (dotted line).

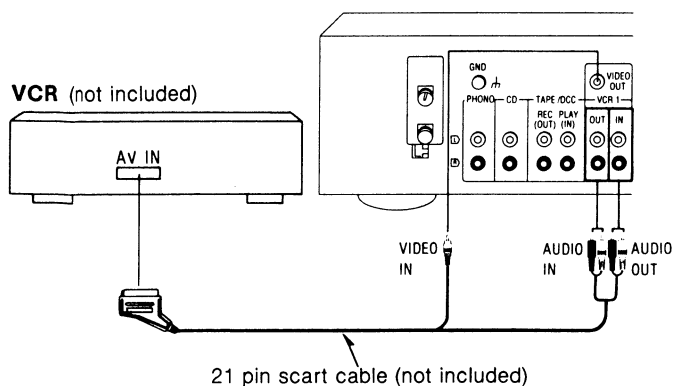


For a CD player (or CD changer) with a remote control sensor the above connection is not necessary.

Connecting video equipment



To connect a video deck with 21 pin scart terminal



PROTECTION CIRCUITRY

The protection circuitry may have operated if either of the following conditions is noticed:

- No sound is heard when the power is turned on.
- Sound stops during a performance.

The function of this circuitry is to prevent circuitry damage if, for example, the positive and negative speaker connection wires are "shorted", or if speaker systems with an impedance less than the indicated rated impedance of the amplifier are used.

If this occurs, follow the procedure outlined below:

1. Turn off the power.
2. Determine the cause of the problem and correct it.
3. Turn on the power once again after one minute.

Note:

When the protection circuitry functions, the unit will not operate unless the power is first turned off and then on again.

REMOTE CONTROL OPERATION

	Basic operations	
	To turn the unit ON/OFF	POWER -AUDIO ○ (Touch only)
	To select an input source	TUNER TAPE CD VCR 1 ○ ○ ○ ○ Note 1. VCR 2 and PHONO can not be selected by this remote control. 2. When selecting DCC, press TAPE.
	To turn the tape monitor function ON	While recording is being made. TAPE ○
	(While listening to RDS broadcasts) To change the display mode	DISPLAY MODE ○ This display mode changes each time the button is pressed.
	(While listening to RDS broadcasts) To select the desired program type	PTY SELECT ○ The PTY display changes each time the button is pressed.
	(While listening to RDS broadcasts) To start PTY search	SEARCH ○
	To mute the sound level	○ MUTING Press once more to return to the original volume.
	To adjust the volume level	- VOLUME + ○ ○
	If your unit is equipped with the Technics Remote Control System	
To turn the system OFF	POWER -AUDIO ○ Press for approx. 2 seconds. (This may not be possible with some models.)	

To listen to radio broadcasts	
TUNER ○	1 2 3 4 5 6 7 8 9 0 ○
Specify the preset channel using the numeric button(s).	
(Example: Channel 12) 1 → 2 Within 2 sec.	

BEFORE REPAIR AND ADJUSTMENT

Disconnect AC power, Discharge both Power Supply Capacitors C703 and C704 (56V 4700μF), C705 and C706 (35V 4700μF) through a 10Ω, 5W resistor to ground.
DO NOT SHORT-CIRCUIT DIRECTLY (with a screwdriver blade, for instance), as this may destroy solid state devices.
After repairs are completed, restore power gradually using a variac, to avoid overcurrent.
Current consumption at 50Hz/60Hz in NO SIGNAL mode should be shown below with respect to supply voltage AC 230V/240 V.

Power supply voltage	AC 230V		AC 240V	
Consumed current 50/60Hz	50 Hz	120~350mA	50 Hz	130~380mA
	60 Hz	96~280mA	60 Hz	104~304mA

■ OPERATION CHECKS AND MAIN COMPONENT REPLACEMENT PROCEDURE

NOTE

1. This section describes procedures for checking the operation of the major printed circuit boards and replacing the main components.
2. For reassembly after operation checks or replacement, reverse the respective procedures. Special reassembly procedures are described only when required.
3. Select items from the following index when checks or replacement are required.
4. Illustrated screws are equivalent to actual size.
5. Refer the parts No. on the page of "Main Component Replacement Procedures", if necessary.

● Contents

•Checking Procedure for each P.C.B.

Page.

1. Checking for the FL P.C.B. and tuner P.C.B. 7.
2. Checking for the main P.C.B. 8,9.

•Main Component Replacement Procedures

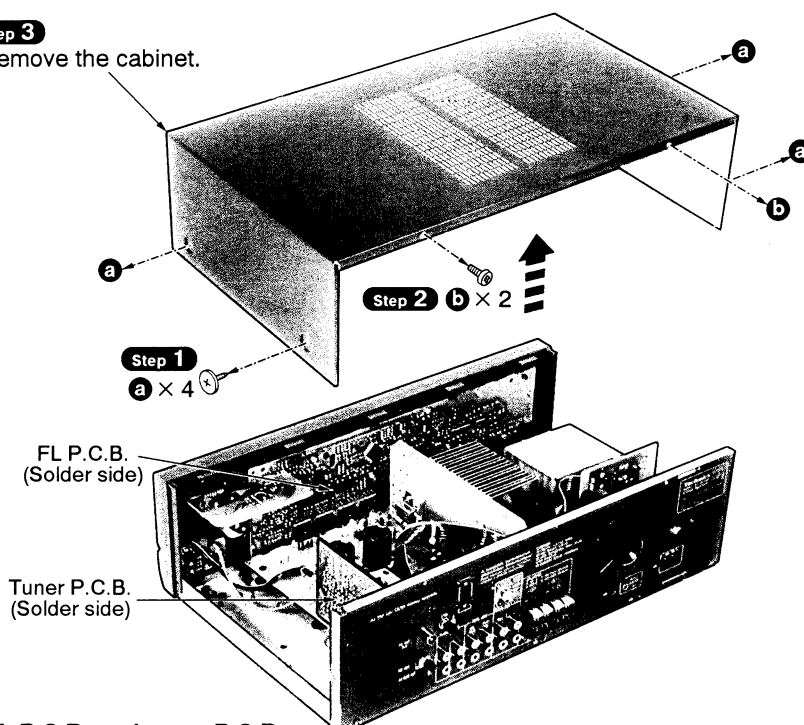
1. Replacement for the foot. 10.
2. Replacement for the power IC and regulator transistor. 10~12.
3. Replacement for the fan motor. 12.

■ Checking Procedure for each P.C.B.

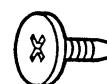
1. Checking for the FL P.C.B. and tuner P.C.B.

Step 3

Remove the cabinet.



- Check the FL P.C.B. and tuner P.C.B. as shown above.

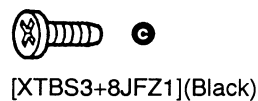
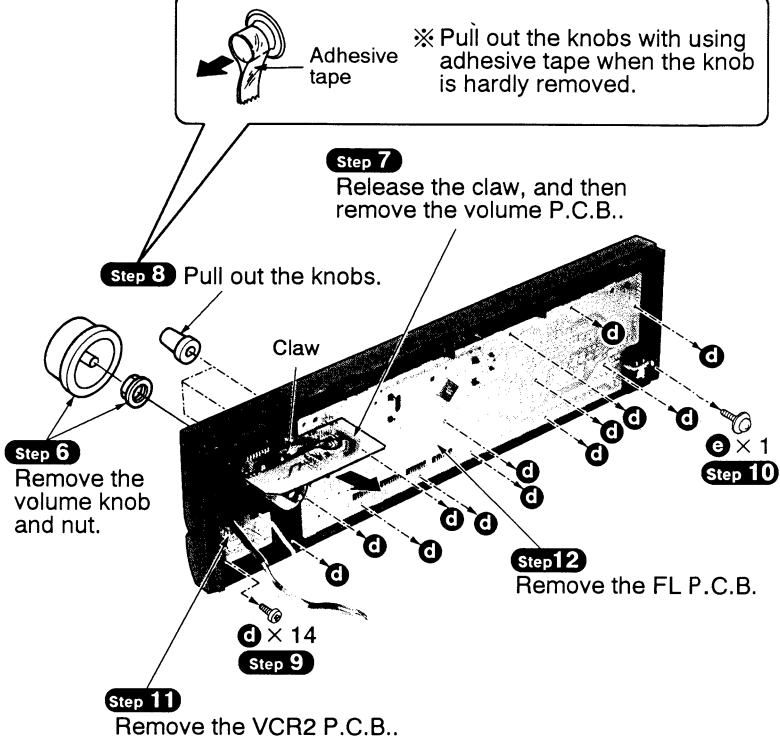
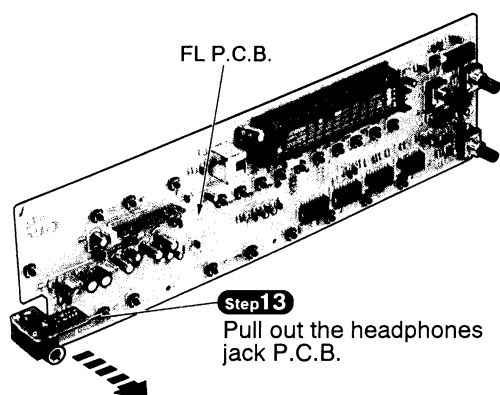
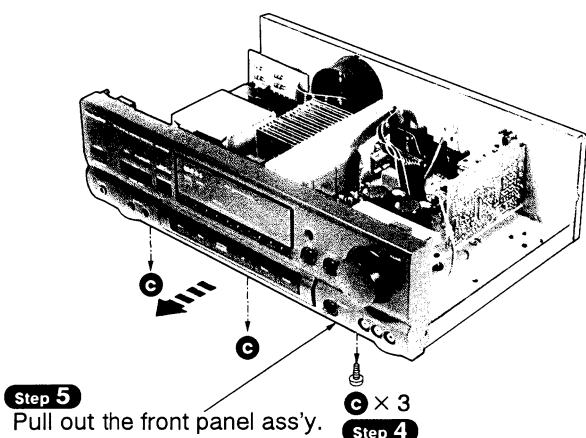


[SNE2129-1] (Black)

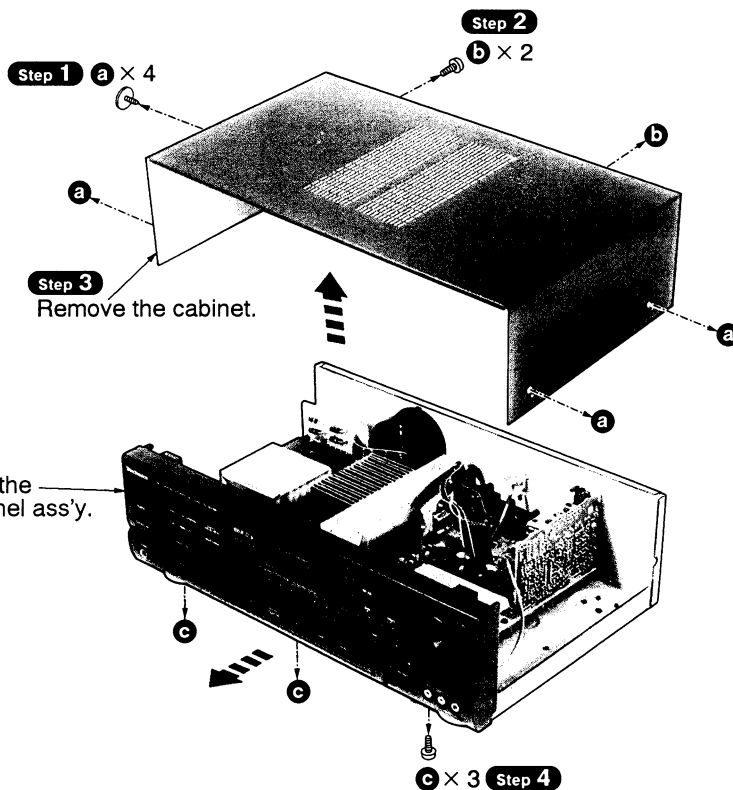


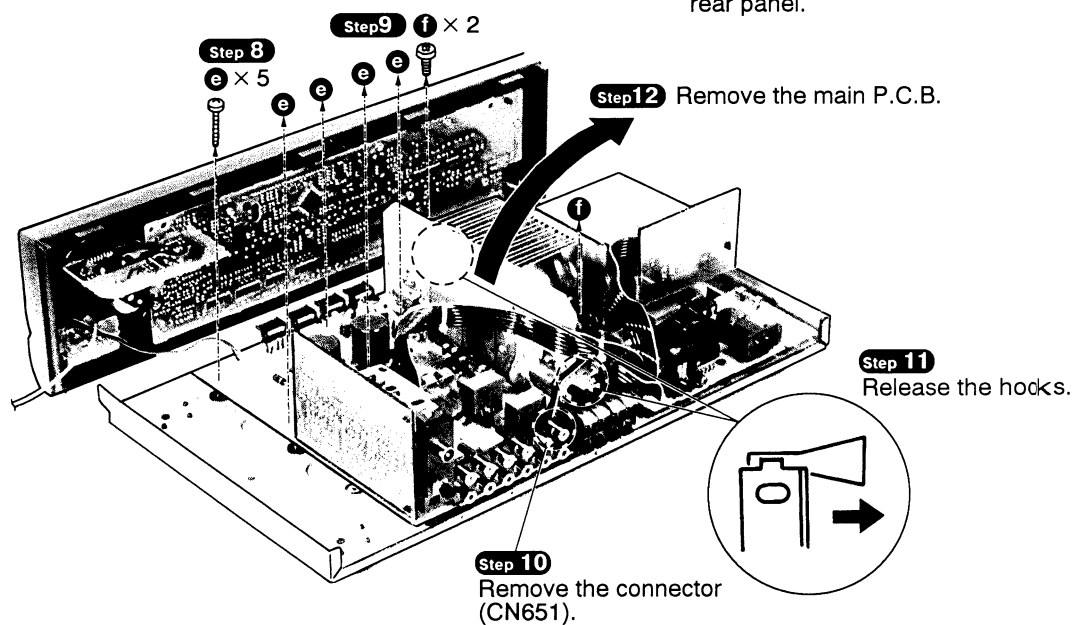
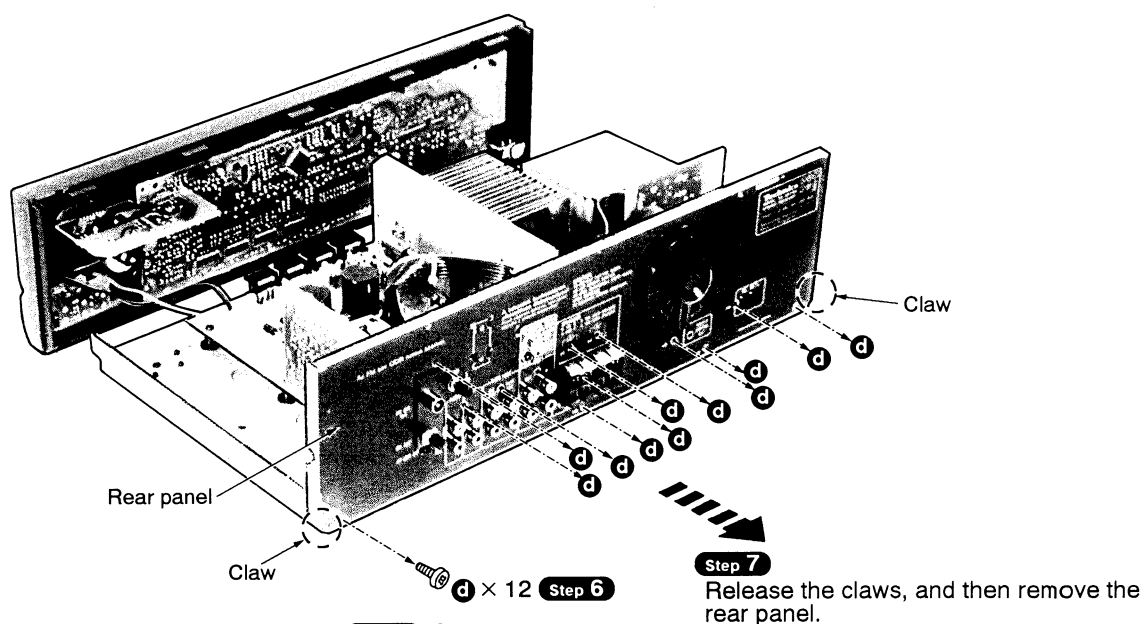
[XTBS3+8JF21] (Black)

To remove each P.C.B.



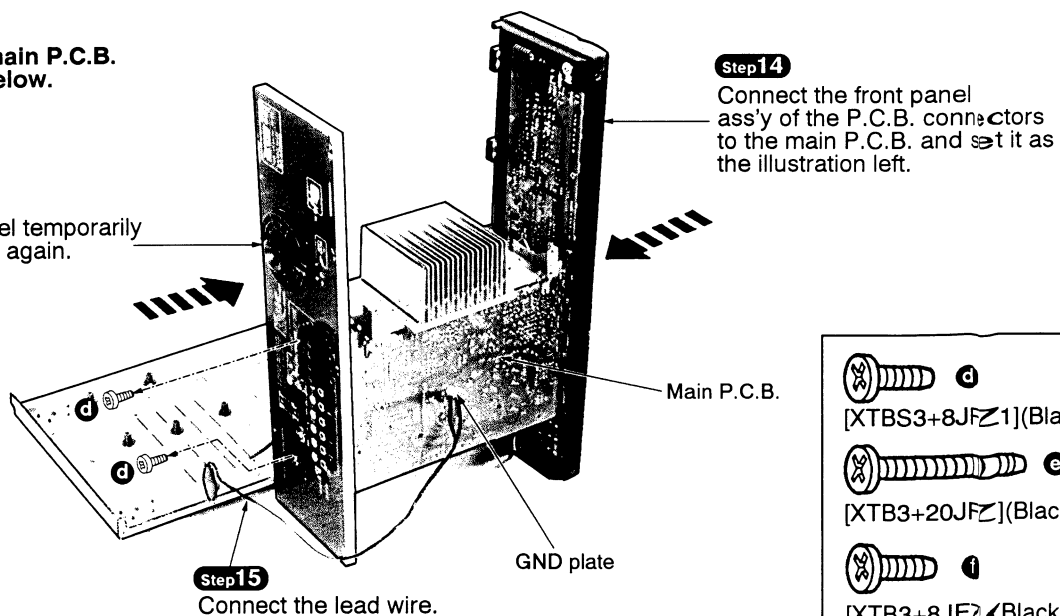
2. Checking for the main P.C.B.





• Check the main P.C.B. as shown below.

Step 13 Install the rear panel temporarily on the main P.C.B. again.



- d**
[XTBS3+8JFZ1](Black)
- e**
[XTB3+20JFZ](Black)
- f**
[XTB3+8JFZ](Black)

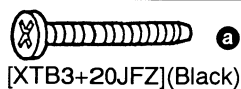
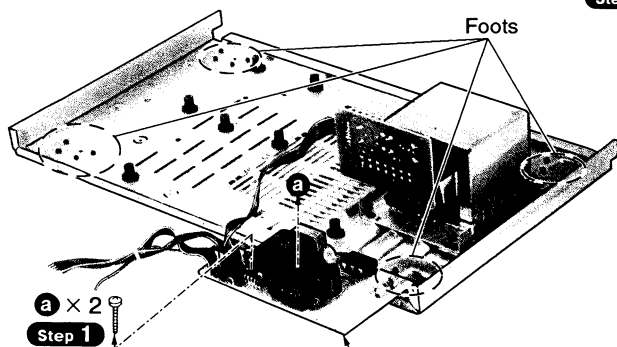
■ Main Component Replacement Procedures

1. Replacement of the foot

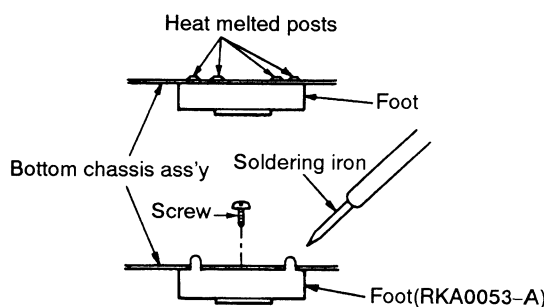
• Follow the **Step 1** ~ **Step 12** in item 2 on checking procedure for each P.C.B. on pages 8 and 9.

Step 3 Remove the 4 heat melted posts on the Bottom chassis ass'y with a pair of nippers or similar tool.

Step 4 To replace the foot(RKA0053-A) on the Bottom chassis ass'y melt the 4 posts with a soldering iron or install it with a screw (XTB3+6J).



Step 2
Remove the power supply P.C.B.

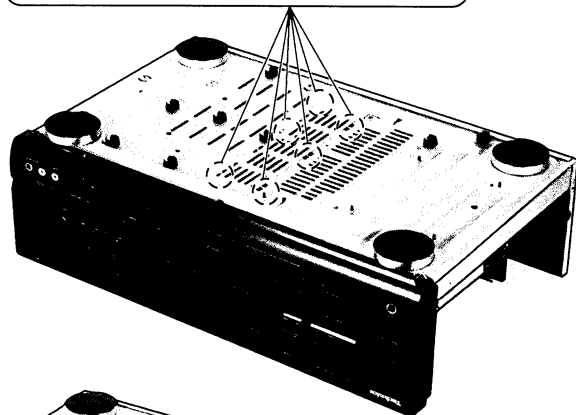
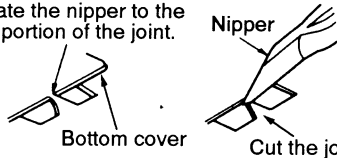


2. Replacement for the power IC and regulator transistor

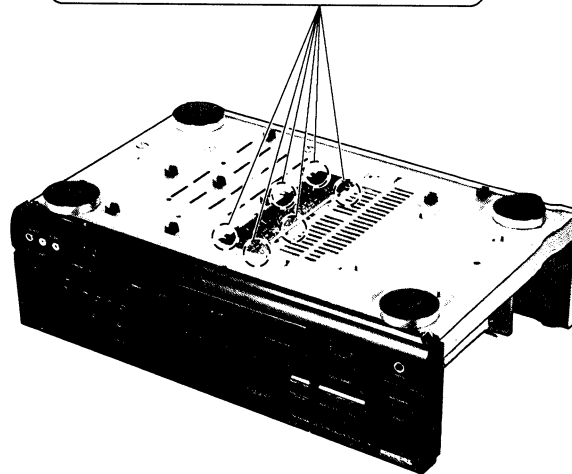
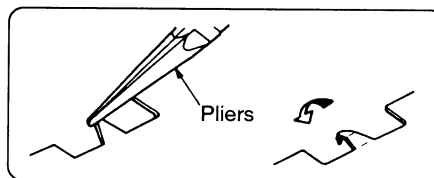
• Follow the **Step 1** ~ **Step 3** in item 1 on checking procedure for each P.C.B. on page 7.

Step 1 Cut the joints as shown below.(6 portions)

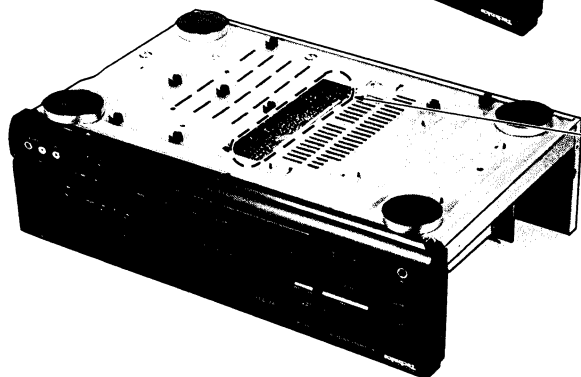
Locate the nipper to the thin portion of the joint.



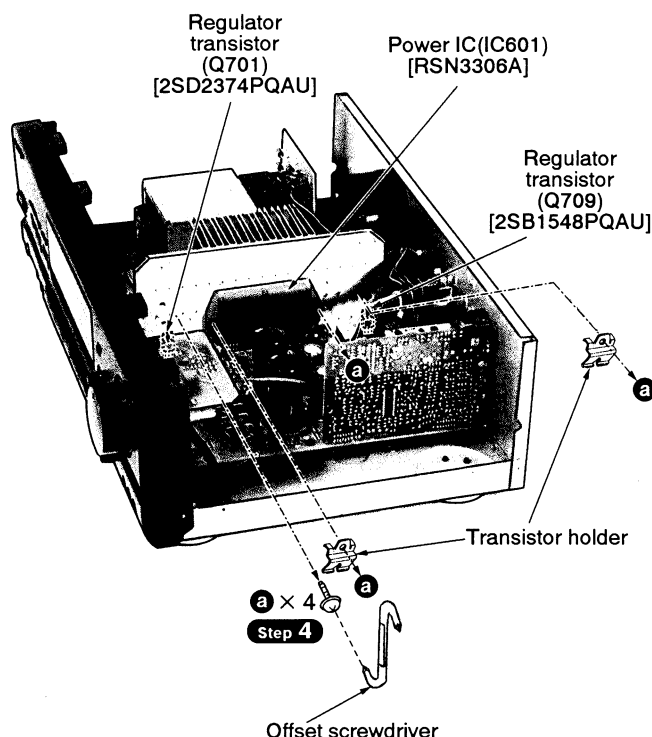
Step 2 Fold the joints.(6 portions)



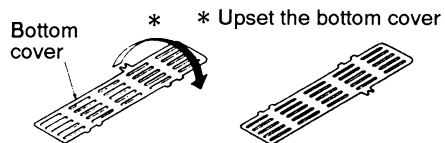
Step 3
Unsolder the terminals of power IC and regulator transistor.



Installation of the bottom cover after replacement

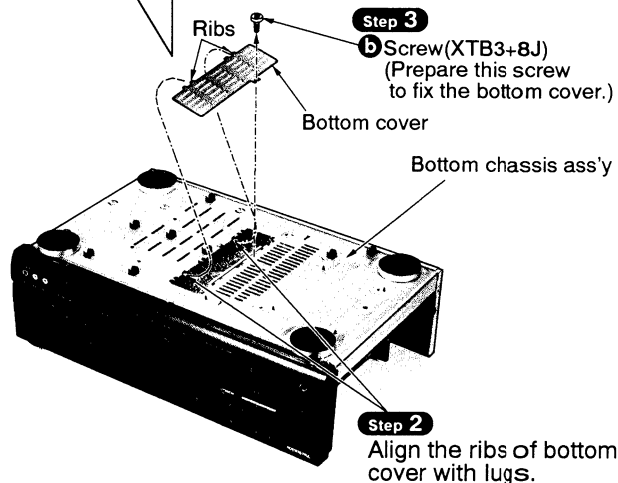


Step 1



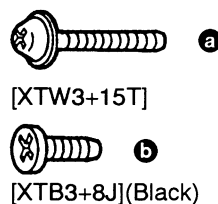
Step 3

b Screw(XTB3+8J)
(Prepare this screw to fix the bottom cover.)



CAUTION

1. After replacing the power IC or regulator transistor, apply a sufficient quantity of compound grease (RFKX0002) between the heat sink and the power IC or regulator transistor (Radiation of power IC).
 2. Tighten enough the screws (a) after replacing the power IC and regulator transistor. Otherwise, the heat radiation works little.
 3. When installing or removing the power IC or transistor holder, be sure to use an offset screwdriver.
- A long straight screwdriver cannot be used for removal or mounting since its long grip interferes with the neighboring P.C.B. (See Fig.1)
 - A short straight screwdriver may be used for removal, but cannot be used for mounting because the limited space in the unit will not allow sufficient tightening torque. (See Fig.2)



(Prepare this screw to fix the bottom cover.)

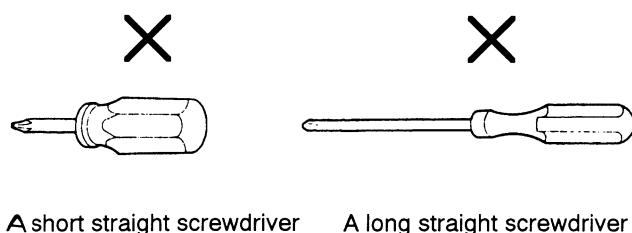


Fig.2

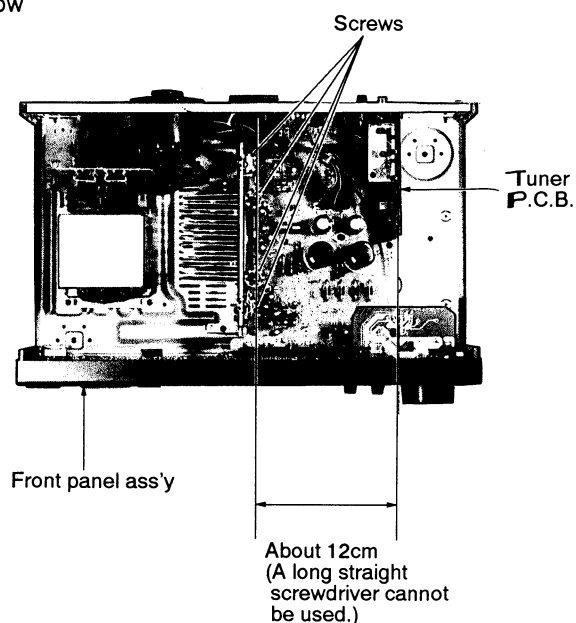
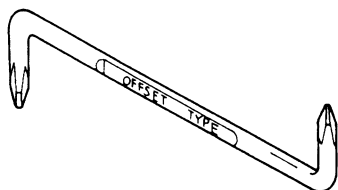


Fig.1

- Insufficient tightening will cause poor heat dissipation from the power IC and regulator transistor and, in the worst case, may lead their thermal breakdown. (See Fig.2)

—OFFSET SCREWDRIVER—

- The PROTO offset screwdriver No.34- 1/4 is recommended for use in the application above.



No.		
34 1/4	1 & 2	4 3/4"

- The address of PROTO International Sales is as follows.

**International Sales**

International Sales Office
Stanley-Proto Industrial Tools
14117 Industrial Park Blvd.
Covington, GA 30209 U.S.A.
Fax: 706-786-4387
Phone: 706-787-3800

Singapore, Indonesia,
Philippines, Korea, Hong
Kong, Malaysia, China.
Stanley-Proto Asia Pacific
12 Gul Drive
Singapore 2262
Fax: 65-861-3206
Phone: 65-862-0883

Australia, New Zealand &
South Pacific
Stanley-Proto Industrial Tools
P.O.Box 10
400 Whitehorse Road
Nunawading 3131
Victoria, Australia
Fax: 61-3-894-1173
Phone: 61-3-878-9244

Thailand
Stanley-Proto Thailand Ltd.
1017 Moo 13 Bangnatrad
Highway, Tambol Bankaew
Amphur Bangplee
Samutprakarn, Thailand
Fax: 66-2-316-6071
Phone: 66-2-316-8655

Japan
Stanley Works Japan
2-7-16 Hyakunin-Cho
Shinjuku-ku
Tokyo 160 Japan
Fax: 81-3-3360-8456
Phone: 81-3-3360-8458

Mexico
Herramientas Stanley S.A.
DE C.V.
Apartado Postal 675
72030 Puebla, Pue, Mexico
Fax: 52-22-494-4880
Phone: 52-22-495-300

South & Central America,
Puerto Rico, The Caribbean
Stanley Inter-America
2101 N.W. 84th Ave.
Miami, Florida 33122
Fax: 305-594-4261
Phone: 305-591-3828

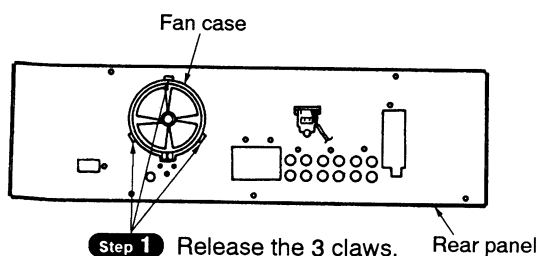
Europe
Stanley-Proto Europe
Woodside, Sheffield
539PD
England
Fax: 44-742-739-038
Phone: 44-742-768-888

Canada
Stanley-Proto Canada
1100 Corporate Drive
Burlington, Ontario
Canada, L7L 5R6
Fax: 416-335-0075
Phone: 416-335-0075

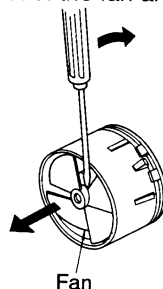
Middle East, Mediterranean
& Africa
Stanley-MEMA
Cory House The Ring
Bracknell Berkshire
RG 12 1A2
England
Fax: 44-344-485-526
Phone: 44-344-51813

3. Replacement for the fan motor

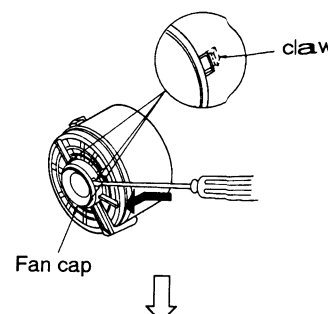
- Follow the **Step 1** ~ **Step 9** in item 2 on checking procedure for each P.C.B. on pages 8 and 9.



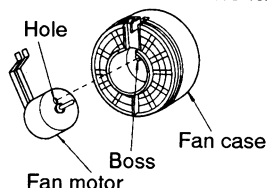
- Step 2**
Put a screwdriver at the root of the fan and remove it.



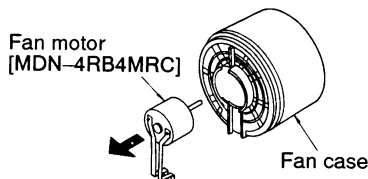
- Step 3**
Remove the fan cap.

**NOTE**

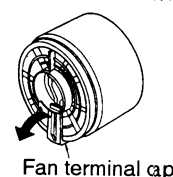
When replacing the fan motor, align the boss of the fan case with the hole of the fan motor.



- Step 5**
Remove the fan motor.



- Step 4**
Remove the fan terminal cap.

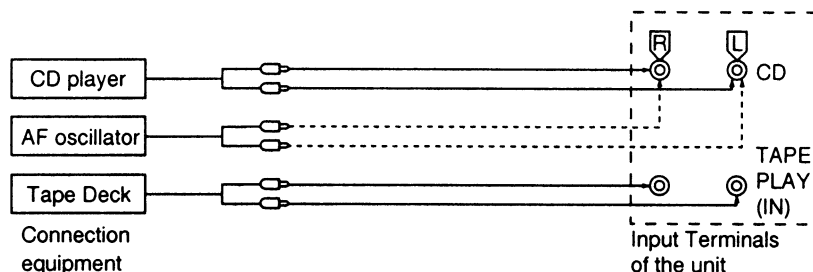


■ TROUBLESHOOTING

This unit has test points on each circuit board block for use in troubleshooting.

CONNECTION

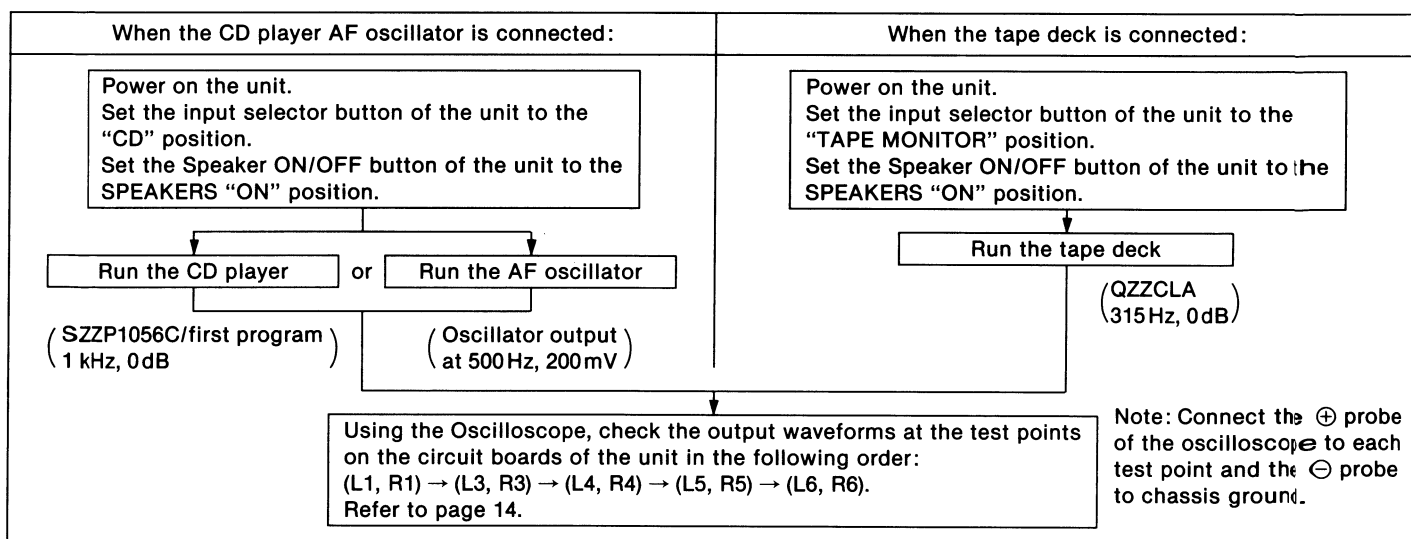
Connect either a CD player, tape deck or AF oscillator to the input terminals of the unit.



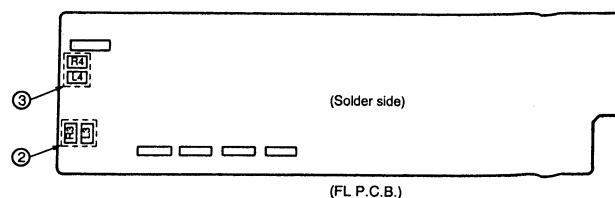
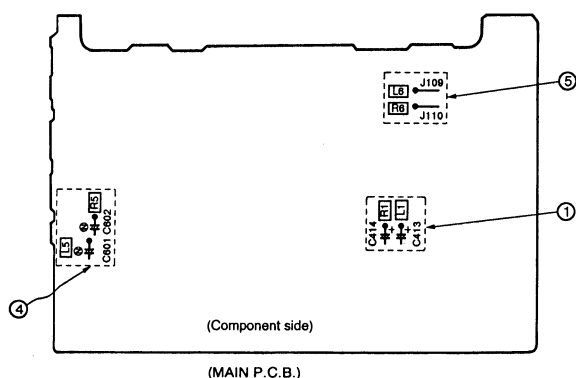
REQUIRED ITEMS

- ① Testing with a CD player ————— Test deck (SZZP1054C/first program, 1 kHz, 0dB)
- ② Testing with a tape deck ————— Test tape (QZZCLA/315Hz, 0dB)
- ③ Testing with a AF oscillator ————— Set the output at 500Hz, 200mV
- ④ Oscilloscope (min. 10MHz) To measure the output waveform at the test points.

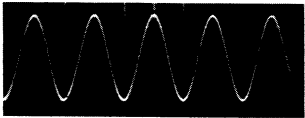
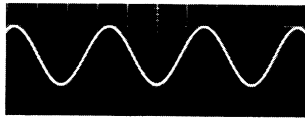
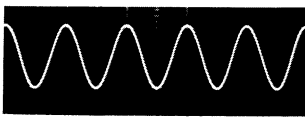
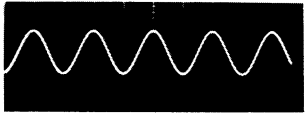
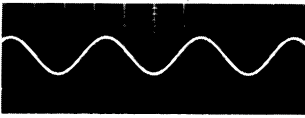
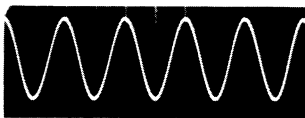
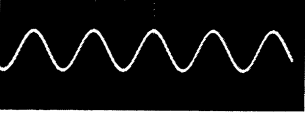
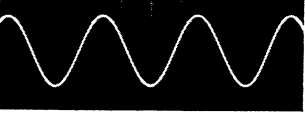
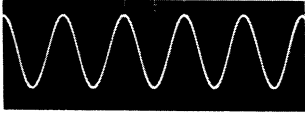
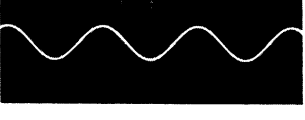
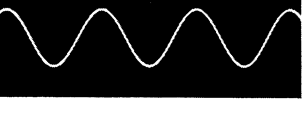
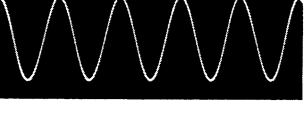
TEST PROCEDURE FOR AMPLIFIER CIRCUIT



TEST POINTS POSITIONS OF AMPLIFIER CIRCUIT

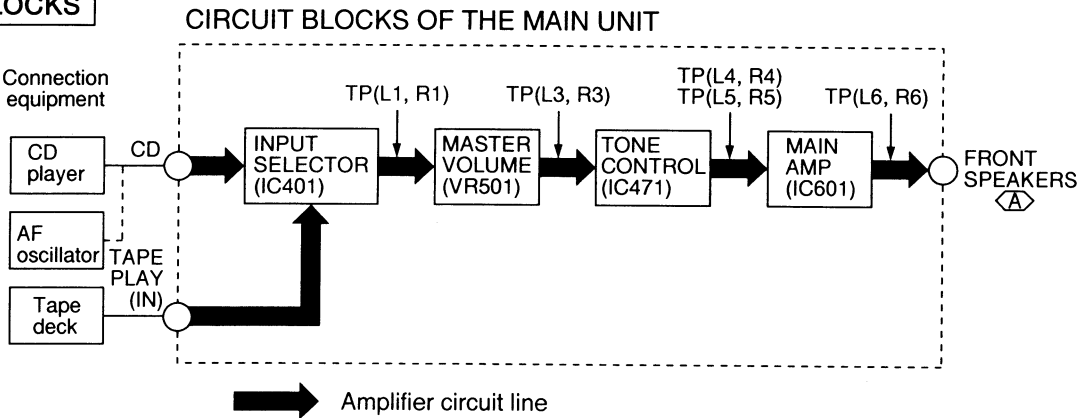


NORMAL WAVEFORMS OF AMPLIFIER CIRCUIT AND LIKELY FAULY BLOCKS

No.	TP	CD player	Tape deck	AF oscillator	Likely faulty block if the normal waveform shown at left is not present.
①	L1/R1	 0.5msec 2V	 1msec 500mV	 1msec 500mV	Input selector block IC402 & area
②	L3/R3	 0.5msec 0.5mV	 1msec 100mV	 1msec 500mV	Master volume block VR501 & area
③	L4/R4	 0.5msec 5V	 1msec 500mV	 1msec 500mV	Tone control block IC471 & area
④	L5/R5	 0.5msec 2V	 1msec 500mV	 1msec 200mV	
⑤	L6/R6	 0.5msec 5V*	 1msec 1V*	 1msec 1V*	Main amplifier block IC601 & area

Measurement conditions. Volume control (VR501), Treble control (VR472) and Bass control (VR471) positions: ○
* Volume control position (VR501) for these test : ○

CIRCUIT BLOCKS



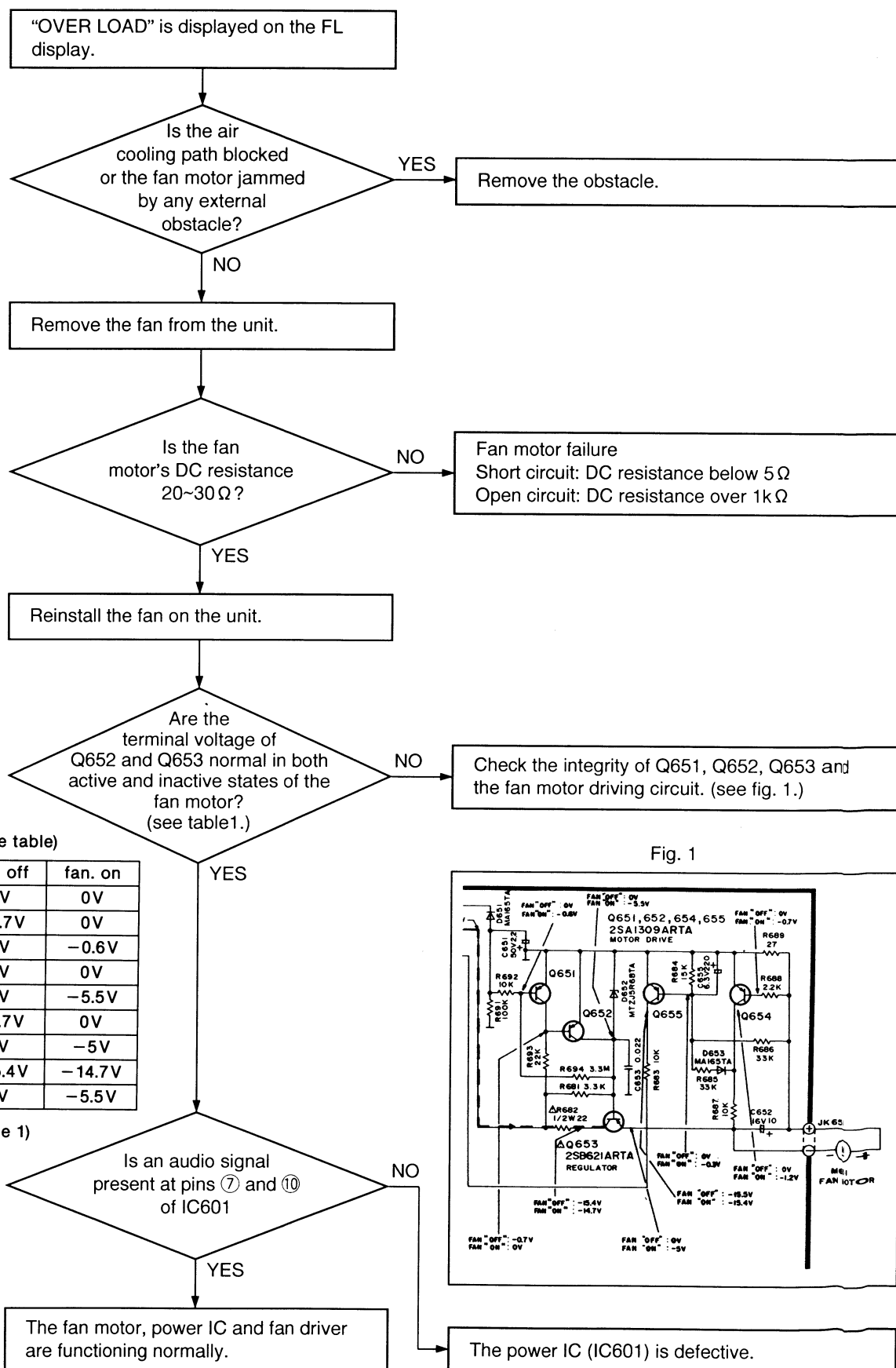
OVERLOAD DETECTION FUNCTION

The HIC protection circuit functions if any cord at a speaker terminal is short-circuited or if the unit overheats because of improper operation. At the same time, 『OVERLOAD』 scrolls across the FL display. In this state, all keys remain inoperative; if any key is pressed, 『SWITCH OFF POWER』 scrolls across the FL display. If an overload occurs, immediately power off the unit and check the speaker connections, venting holes and cooling fans. After fixing any faults, power on the unit again and check for proper operation. If no defects are found, or if the unit remains overloaded after it is power on again, check the circuit for faults.

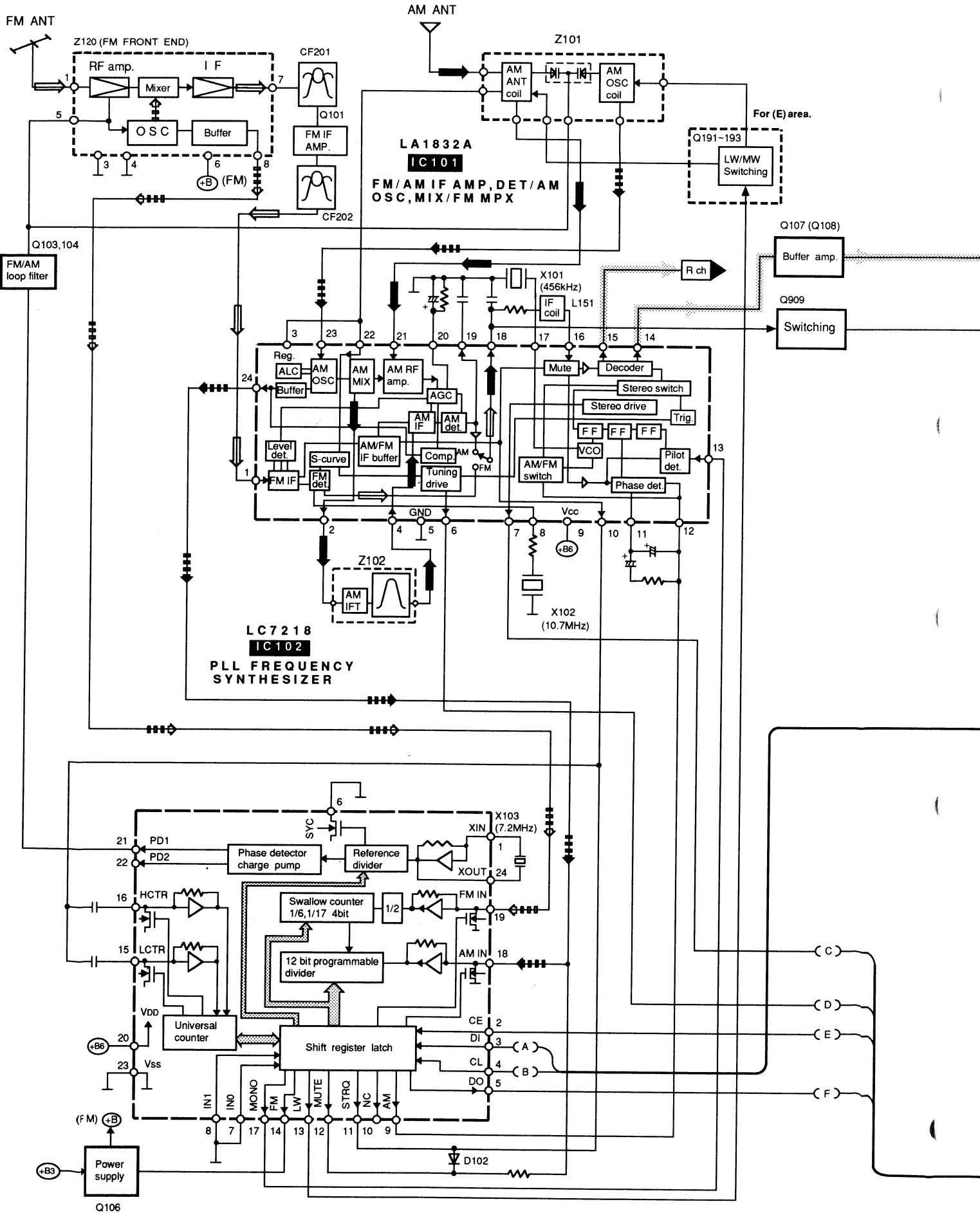
FAN MOTOR TROUBLESHOOTING GUIDE

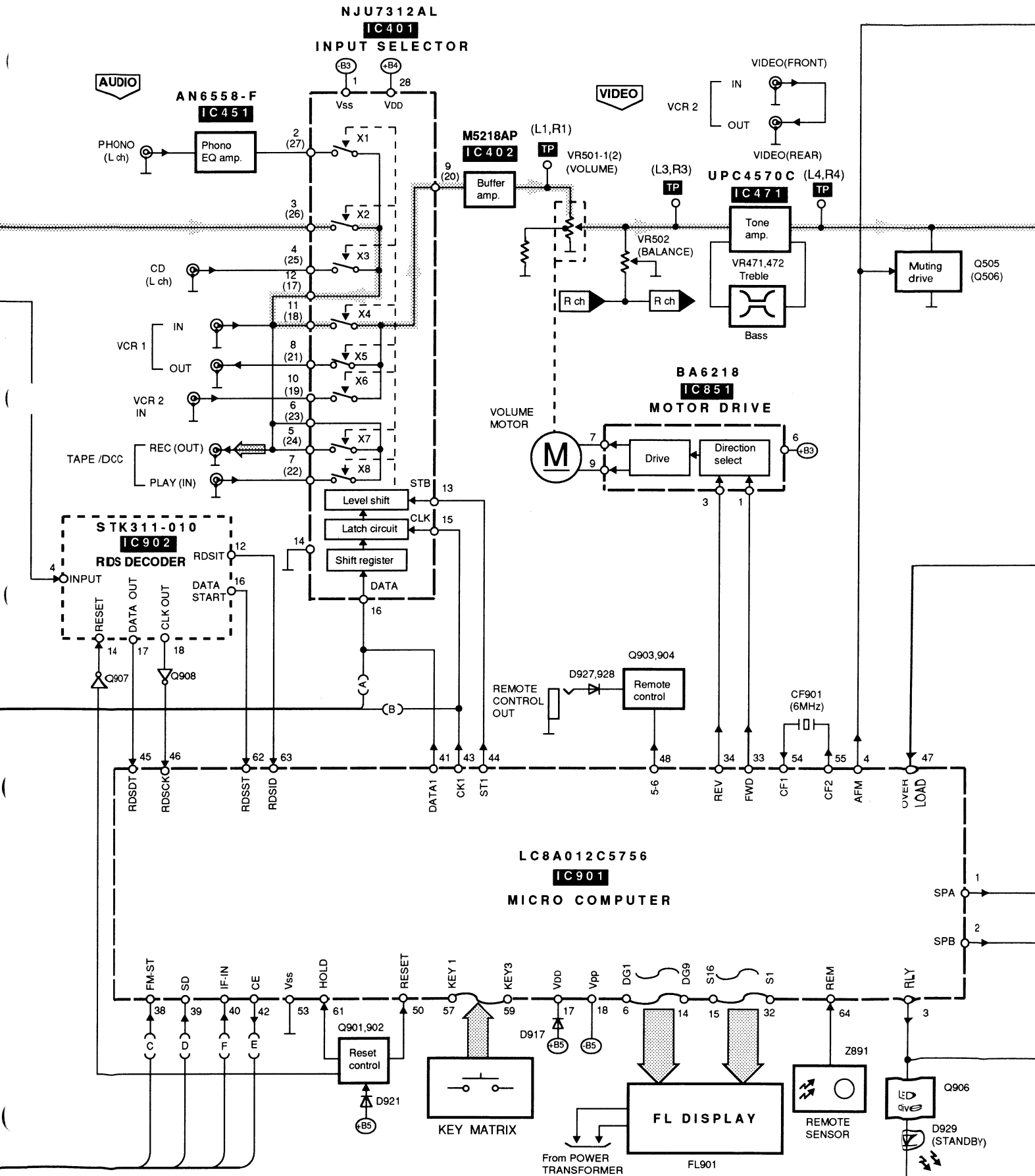
The Model SA-GX280 employ fan motor error sensing electronics.

If the cooling fan is not operation and "OVER LOAD" is displayed on the FL display, check the fan motor and its driving circuit.



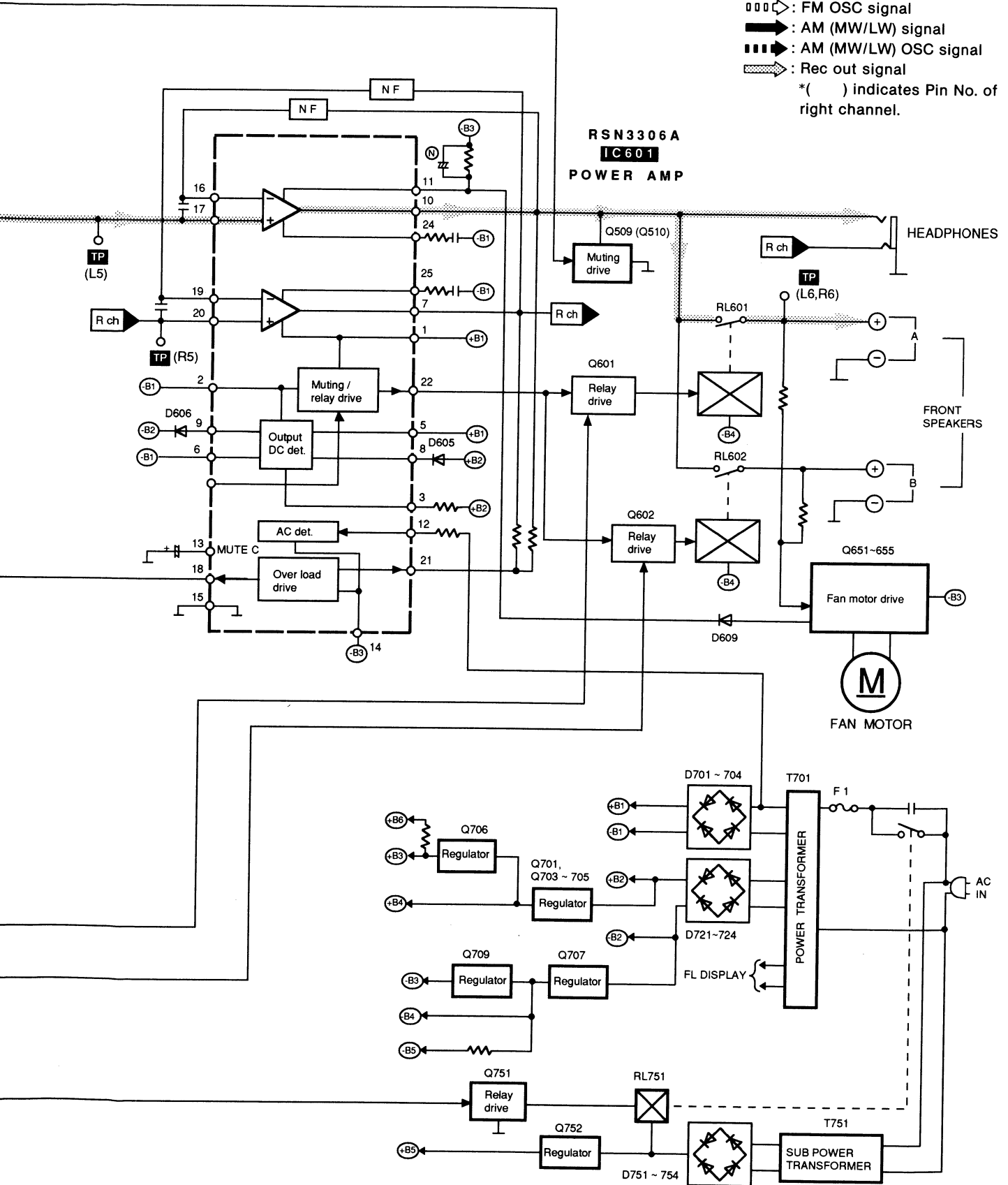
BLOCK DIAGRAM





Notes:

- ⋯⋯⋯ : AF signal
- : FM signal
- : FM OSC signal
- ▬ : AM (MW/LW) signal
- ▬▬▬ : AM (MW/LW) OSC signal
- ▬▬▬ : Rec out signal
- *() indicates Pin No. of right channel.



SCHEMATIC DIAGRAM (Parts list on pages 38~43.)

(This schematic diagram may be modified at any time with the development of new technology.)

Note:

- S950, 951, : Input select switches.
953~955 [S950: VCR 1, S951: VCR 2, S953: CD,]
[S954: TUNER, S955: PHONO]
- S952 : Tape/DCC monitor switch.
- S956 : Numeric (0) switch.
- S960 : Numeric (1) switch.
- S961 : Numeric (2) switch.
- S962 : Numeric (3) switch.
- S963 : Numeric (4) switch.
- S964 : Numeric (5) switch.
- S965 : Numeric (6) switch.
- S966 : Numeric (7) switch.
- S967 : Numeric (8) switch.
- S968 : Numeric (9) switch.
- S957 : Muting (MUTING) switch.
- S970 : Memory (MEMORY) switch.
- S971 : FM mode select (FM MODE) switch.
- S972 : Band select (BAND) switch.
- S973, 974 : Tuning (TUNING) switches.
[S973: TUNING DOWN, S974: TUNING UP]
- S975 : Direct tuning (DIRECT TUNING) switch.
- S976, 977 : Speaker select (SPEAKERS) switches.
[S976: SPEAKERS B, S977: SPEAKERS A]
- S978 : Power "STANDBY /ON".
(POWER STANDBY ON) switch.
- Signal line
 - ▷ : FM OSC
 - ▷ : AM (MW/LW) OSC
 - ▷ : FM signal
 - ▷ : AM (MW/LW) signal
 - ▷ : Rec out signal (Lch)
 - ▷ : AF signal (Lch)
 - : Positive voltage lines
 - : Negative voltage lines

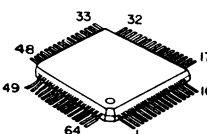
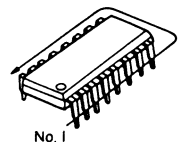
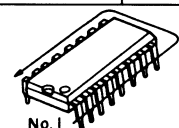
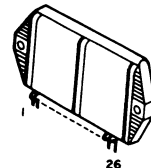
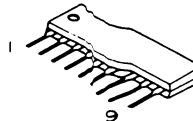
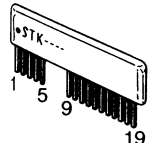
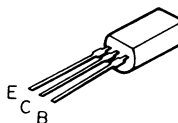
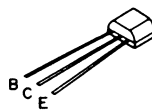
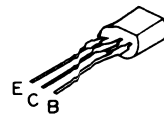
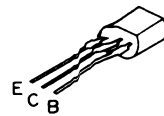
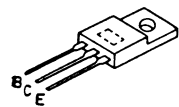
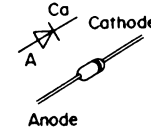
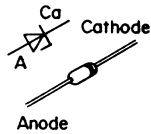
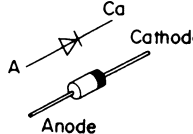
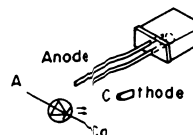
Important safety notice:

- Components identified by $\triangle$ mark have special characteristics important for safety. When replacing any of these components, use only manufacturer's specified parts. Indicated voltage values are standard values for the unit measured by the DC electronic circuit tester (high-impedance) with the chassis taken as standard. Therefore, there may exist some errors in the voltage values, depending on internal impedance of the DC circuit tester.
- All voltage values shown in circuitry are DC voltage in FM signal (Stereo signal) reception mode.
- * Figures in () Stand for DC-voltage in AM (MW) signal reception mode.
- * Figures in < > Stand for DC-voltage in LW signal reception mode.
- L1, L3~L6, R1 and R3~R6 in the schematic diagram show the test points.
- For detail, please refer to p. 13 and p. 14.

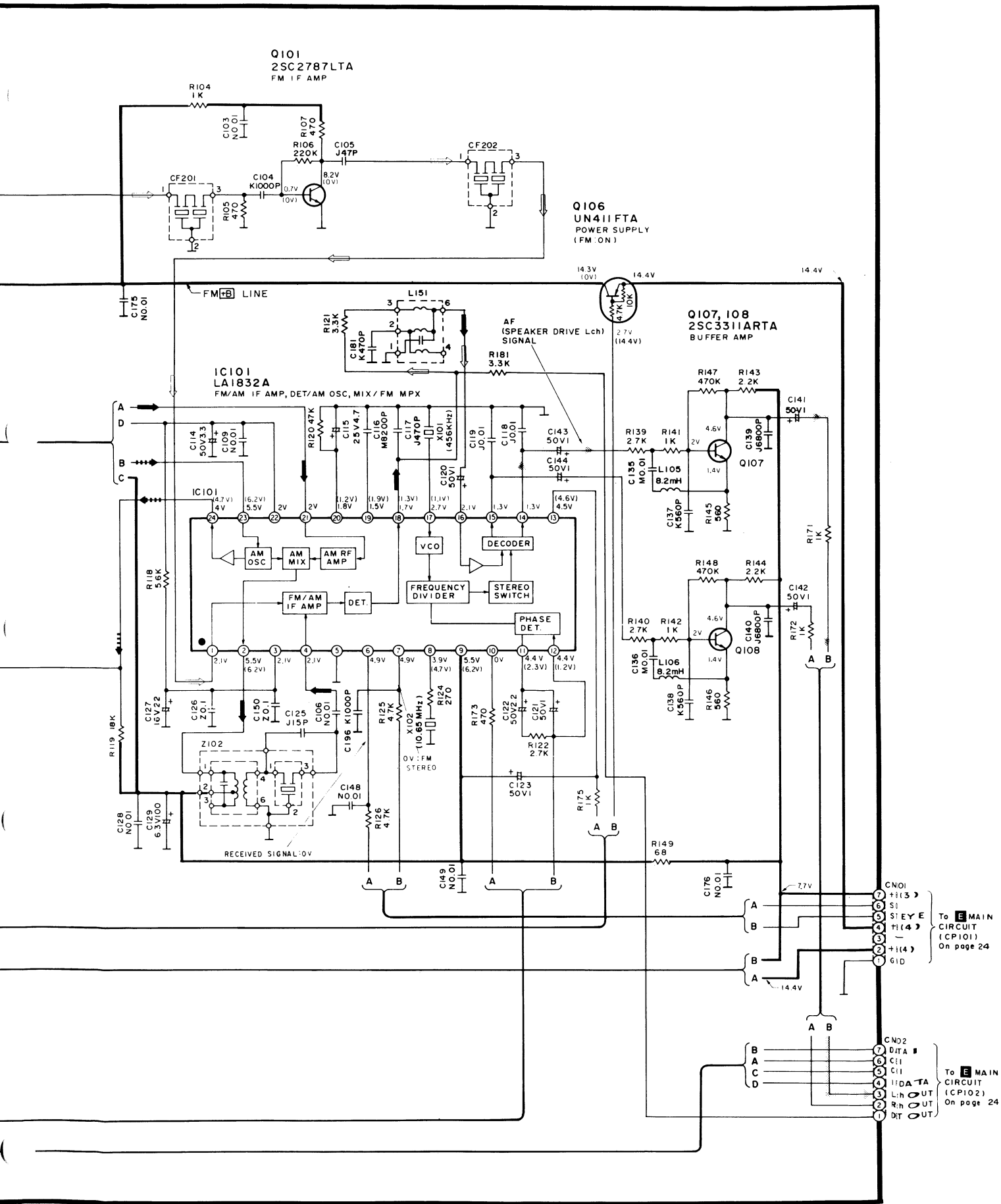
Caution!

- IC and LSI are sensitive to static electricity. Secondary trouble can be prevented by taking care during repair.
- Cover the parts boxes made of plastics with aluminum foil.
- Ground the soldering iron.
- Put a conductive mat on the work table.
- Do not touch the legs of IC or LSI with the fingers directly.

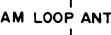
Terminal guide of IC's, transistors and diodes

LC8A012C5756 	<table><tr><td>M5218AP</td><td>8Pin</td></tr><tr><td>LA1832A</td><td>24Pin</td></tr><tr><td>LC7218</td><td>24Pin</td></tr></table> 		M5218AP	8Pin	LA1832A	24Pin	LC7218	24Pin	<table><tr><td>AN6558-F</td><td>8Pin</td></tr><tr><td>UPC4570C</td><td>8Pin</td></tr><tr><td>NJU7312AL</td><td>28Pin</td></tr></table> 	AN6558-F	8Pin	UPC4570C	8Pin	NJU7312AL	28Pin	RSN3306A 	BA5218 
M5218AP	8Pin																
LA1832A	24Pin																
LC7218	24Pin																
AN6558-F	8Pin																
UPC4570C	8Pin																
NJU7312AL	28Pin																
STK311-010 	2SC3940AQSTA 	2SC3327ABTP 	2SA1309ARTA 2SC2785FETA 2SC2787LTA 2SC3311ARTA UN411FTA RVTDTC114YST 	UN421FTA RVDTA144EST RVTDTC114EST 	2SB611ARTA 												
2SD2374PQAU 2SB1548PQAU 	MA165TA MA700ATA 1SS291TA 1SR35200TB 	MTZJ5R1BTA MTZJ7R5CTA MTZJ5R6BTA MTZJ6R2BTA MTZJ22DTA MTZJ16CTA MTZJ6R8CTA MTZJ3R9ATA 	P300DLF SB360L6508 	LN86RPH 													



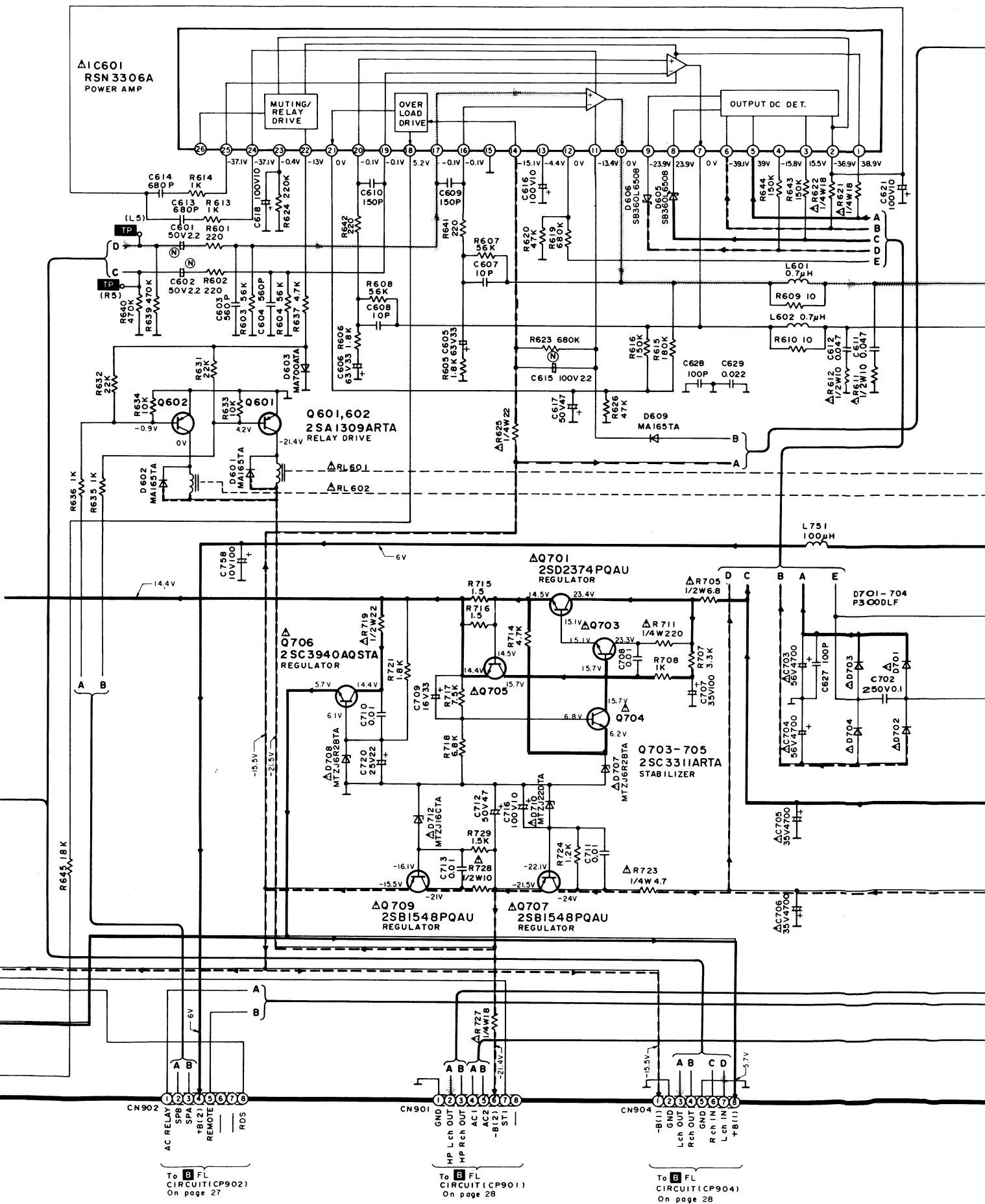


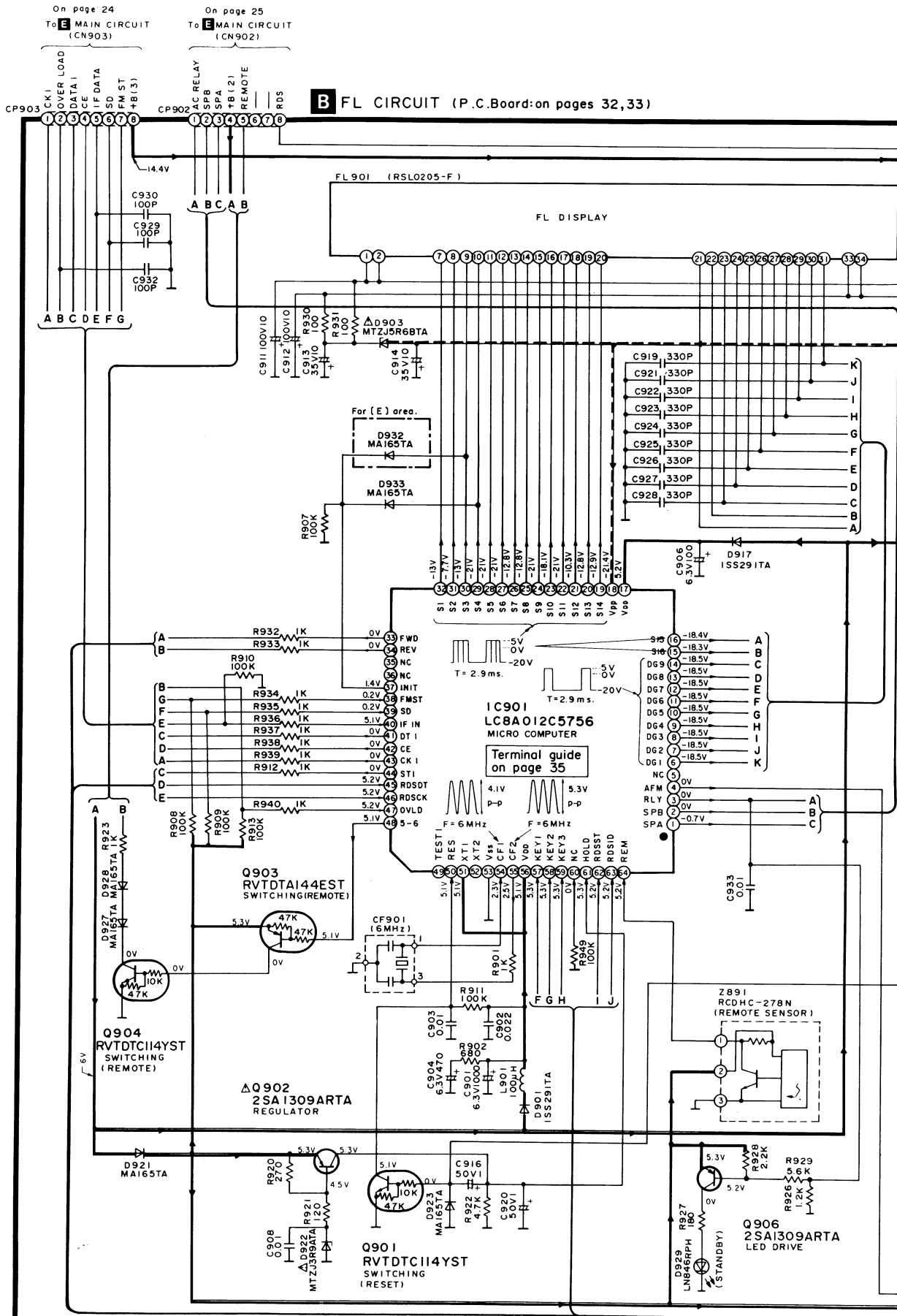
A





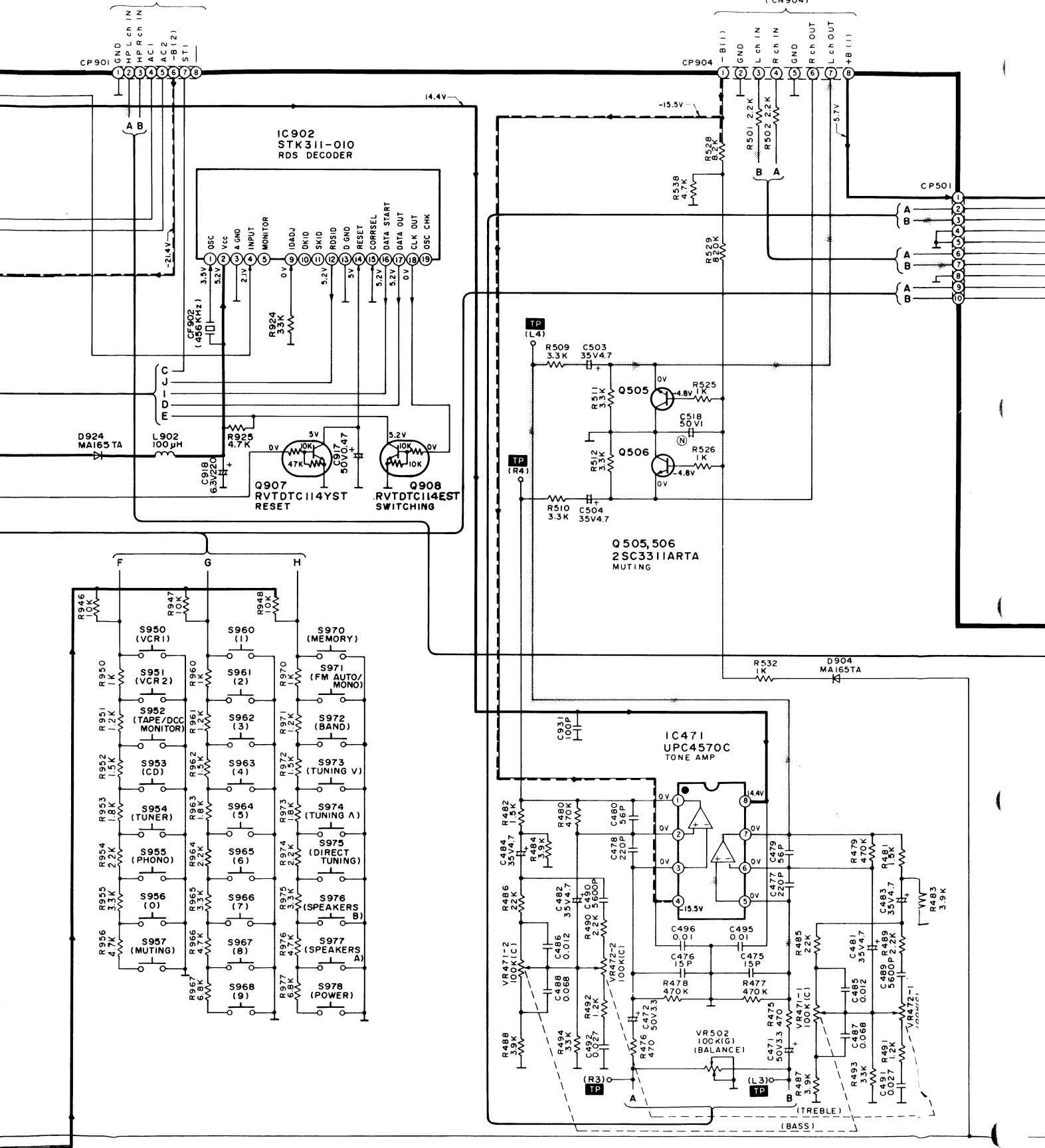




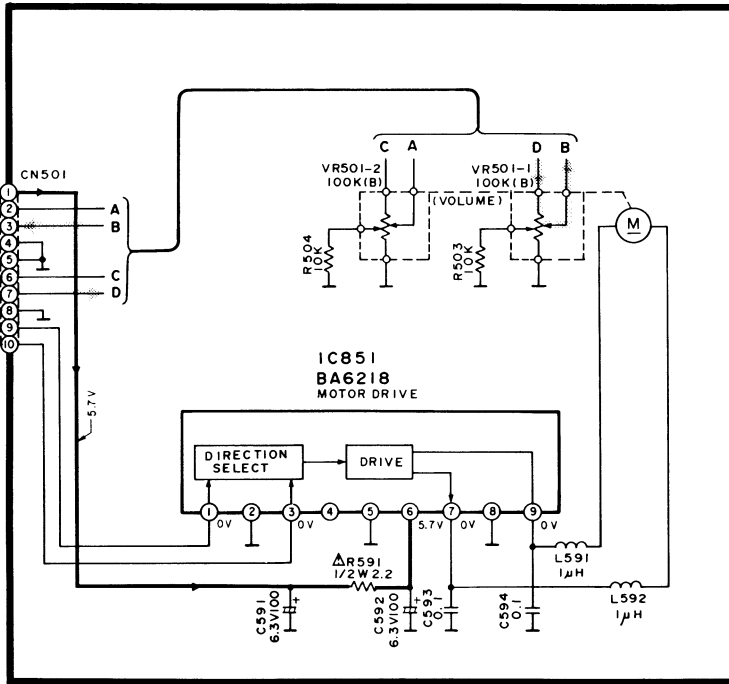


On page 25
To **E** MAIN CIRCUIT
(CN901)

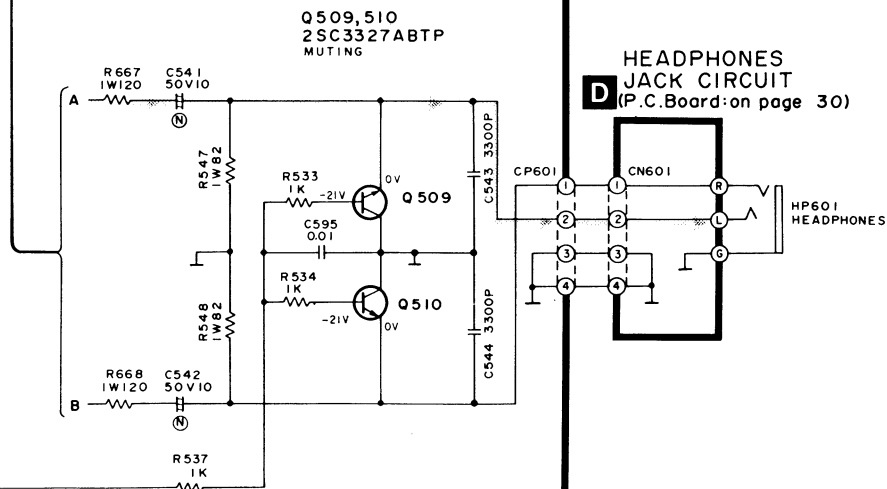
On page 25
To **E** MAIN CIRCUIT
(CN904)



C VOLUME CIRCUIT (P.C.Board: on page 30)



D HEADPHONES JACK CIRCUIT (P.C.Board: on page 30)



A

- ## B

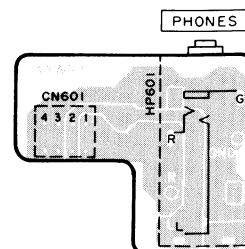
C



E



G



6

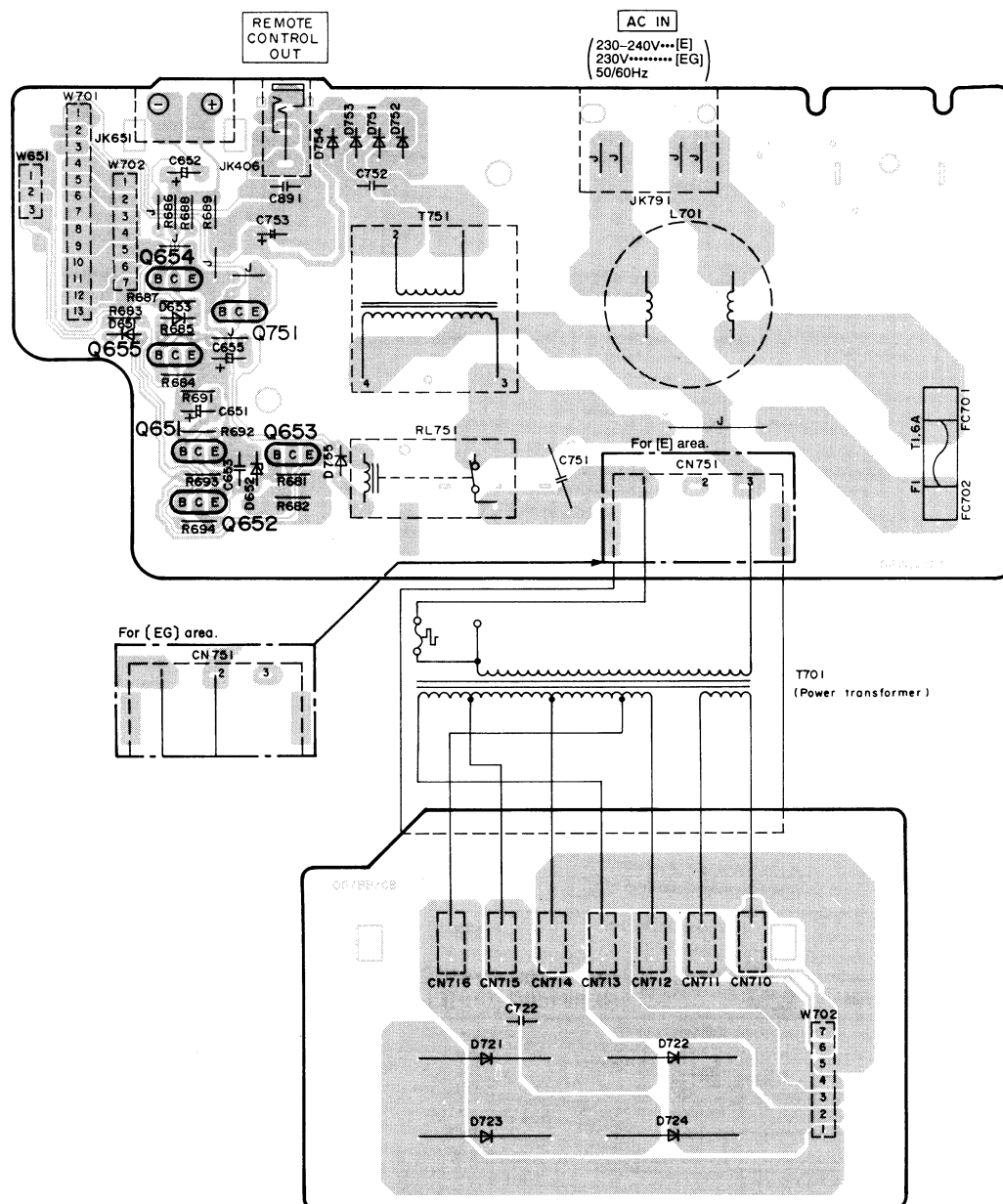
7

8

9

10

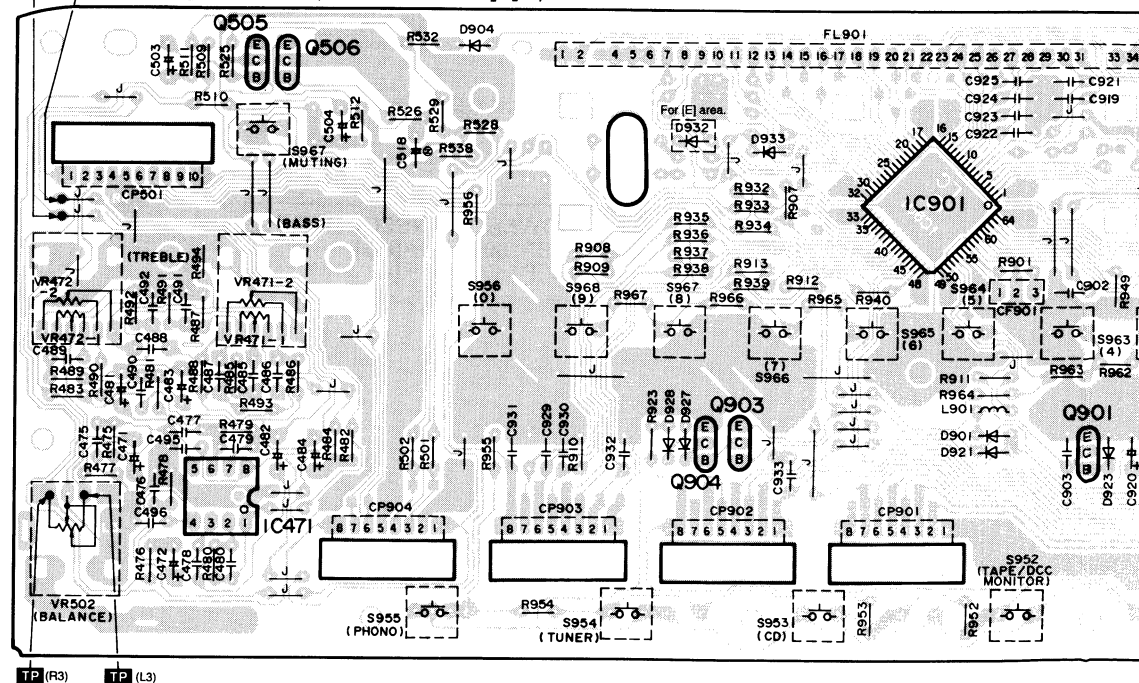
H POWER SUPPLY P.C.B. (REP1605H-P...[EG] REP1605J-P...[E])



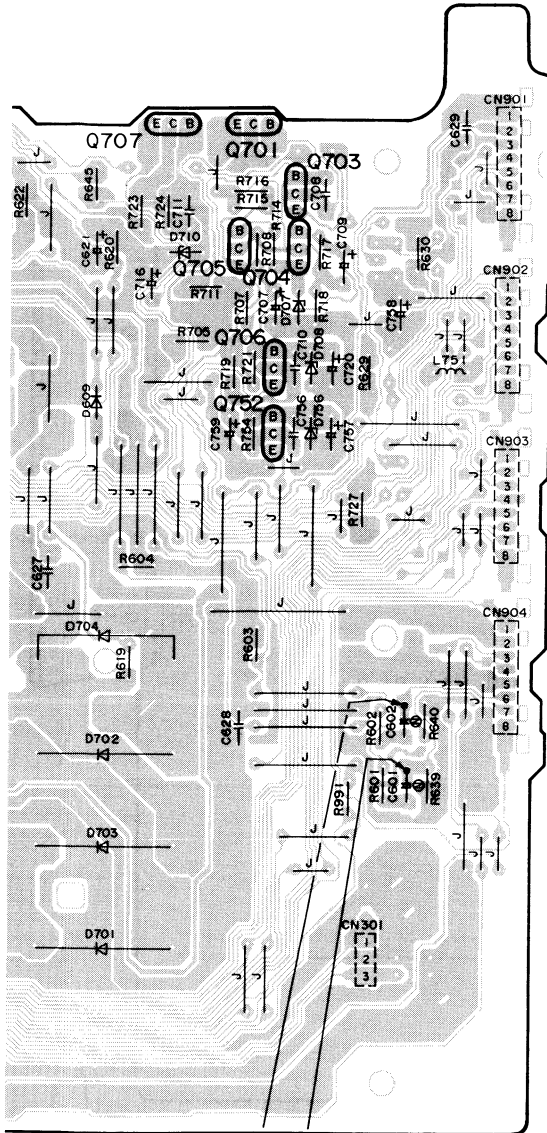
I POWER TRANSFORMER P.C.B. (REP1605H-P...[EG] REP1605J-P...[E])



TP (L1) **TP** (R1)

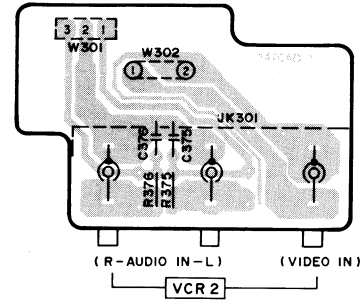


6 7 8 9 10

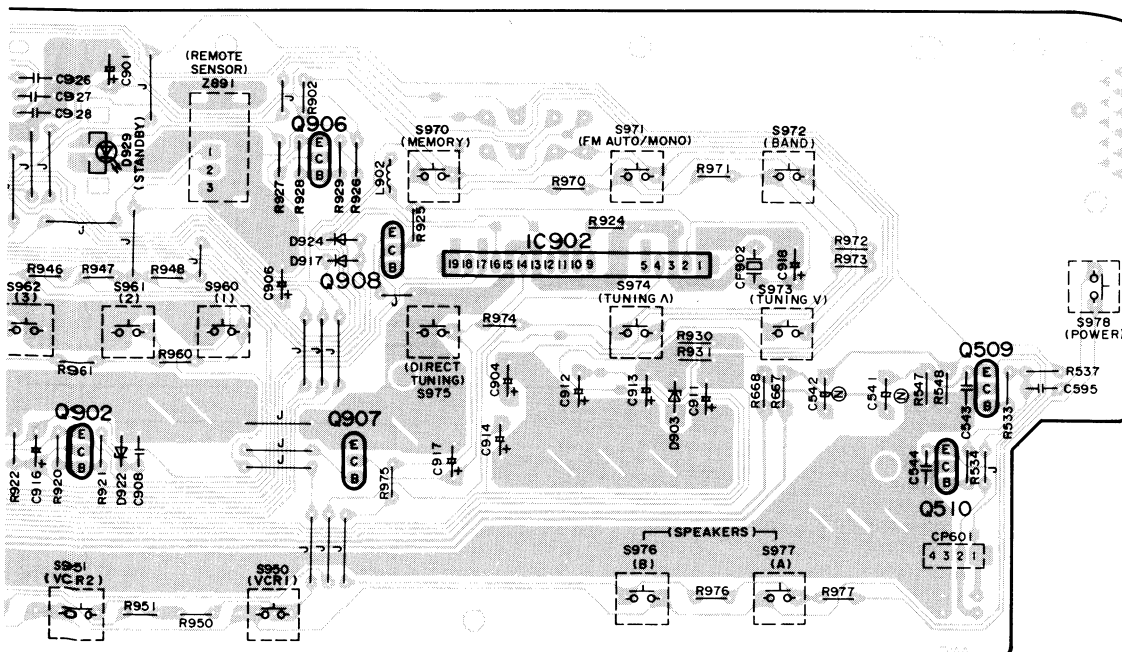
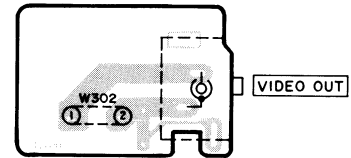


(R5) TP TP (L5)

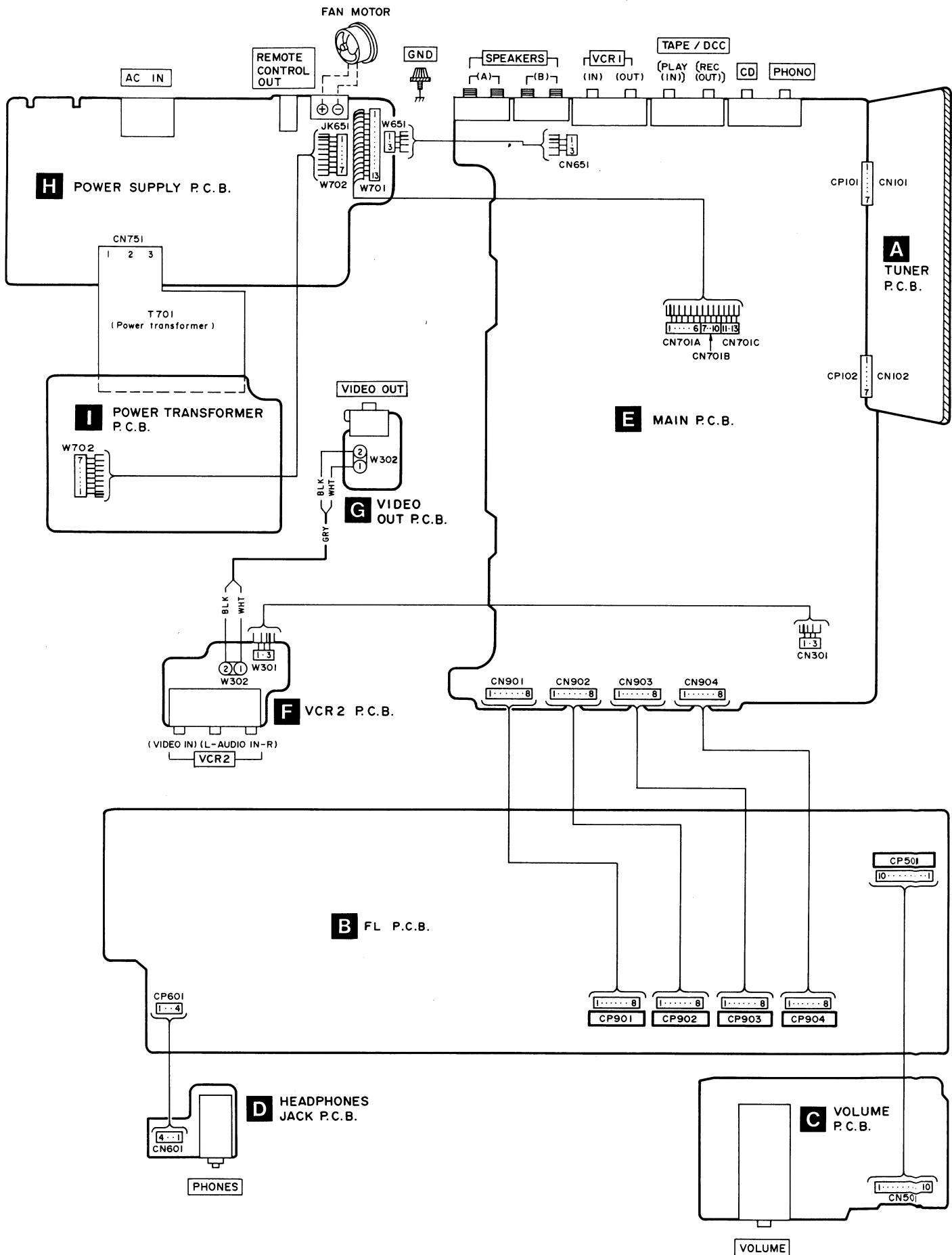
F VCR2 P.C.B. (REP2160C-S...[EG] REP2160D-S...[E])



G VIDEO OUT P.C.B. (REP2160C-S...[EG] REP2160D-S...[E])



WIRING CONNECTION DIAGRAM



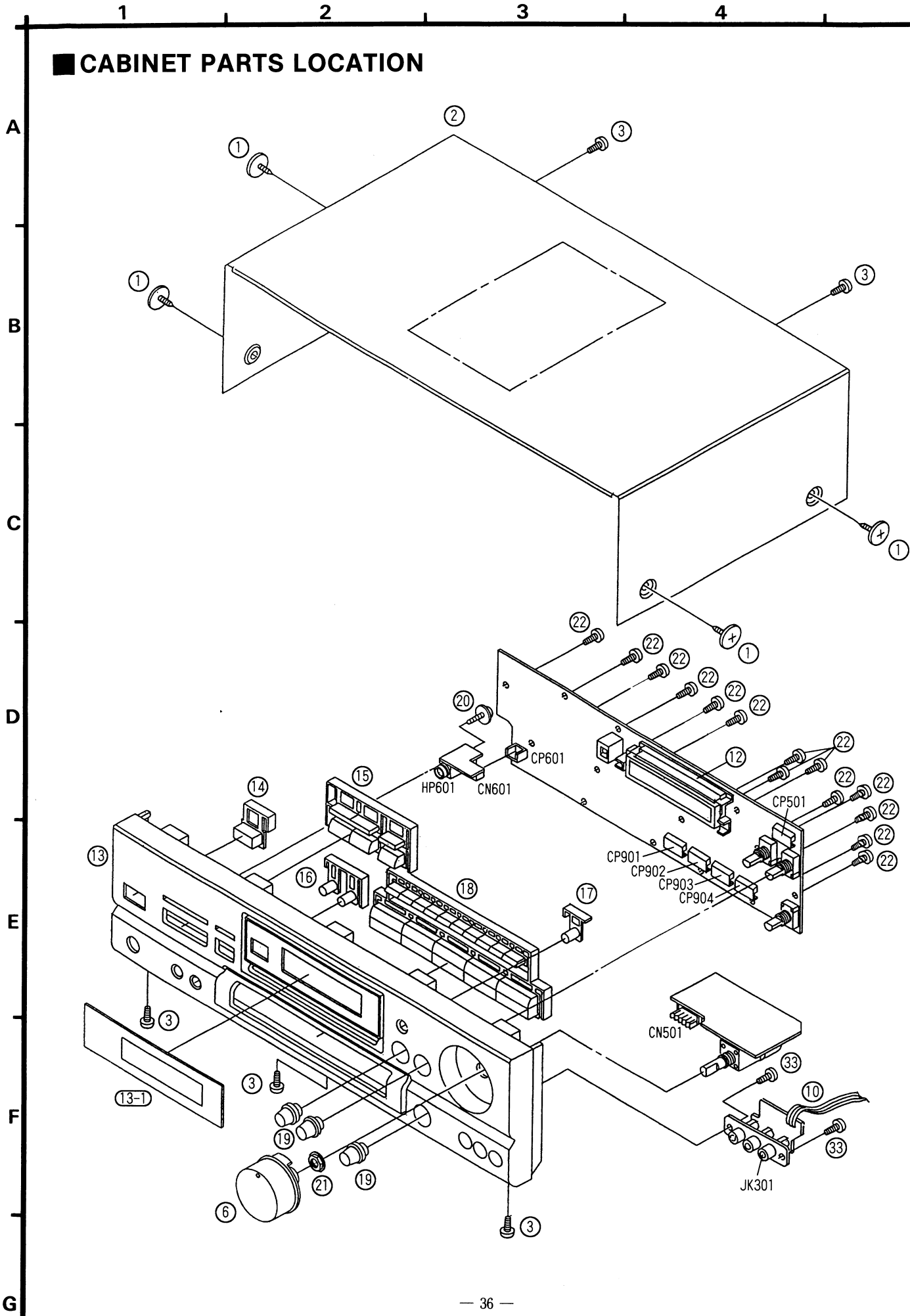
■ TERMINAL GUIDE

• IC901 (LC8A012C5756): Micro computer

Pin No.	Mark	I/O Division	Function
1 • 2	SPA • SPB	O	Speaker select control terminal
3	RLY	O	Relay control terminal
4	AFM	O	Muting control terminal
5	NC	—	Non connection
6 } 14	DG1 } DG9	O	Digit signal of FL display
15 • 16	S16 • S15	O	Segment signal of FL display
17	VDD	I	Power supply terminal
18	VPP	I	Power supply terminal of FL display
19 } 32	S14 } S1	O	Segment signal of FL display
33 • 34	FWD • REV	O	Rotation control terminal of volume motor
35 • 36	NC	—	Non connection
37	INIT	I	Not used, connected to resistor
38	FMST	I	Stereo signal detect terminal
39	SD	I	Received signal detect terminal
40	IF IN	I	Serial data signal
41	DATA1	O	Serial data signal
42	CE	O	Chip enable terminal
43	CK1	O	Serial clock signal
44	ST1	O	Level shift control terminal

Pin No.	Mark	I/O Division	Function
45	RDSDT	I	RDS data input
46	RDSCK	I	RDS clock input
47	OVER LOAD	I	Overl load detect terminal
48	5-6	O	Remote control terminal
49	TEST1	—	Test terminal
50	RES	I	Reset detect terminal
51	XT1	I	Not used, connected to power supply
52	XT2	—	Not used, open
53	VSS	—	GND terminal
54	CF1	I	Crystal oscillator terminal (6MHz)
55	CF2	O	
56	VDD	I	Power supply terminal
57 } 59	KEY1 } KEY3	I	Key matrix detect terminal
60	NC	I	Not used, connected to resistor
61	HOLD	I	Hold signal input terminal
62	RDSST	I	RDS data start signal input
63	RDSID	I	RDS ID signal input
64	REM	I	Remote control terminal

CABINET PARTS LOCATION





REPLACEMENT PARTS LIST

Notes: *Important safety notice:

 Components identified by Δ mark have special characteristics important for safety.

Furthermore, special parts which have purposes of fire-retardant (resistors), high-quality sound (capacitors), low-noise (resistors), etc. are used.

When replacing any of components, be sure to use only manufacturer's specified parts shown in the parts list.

*The parenthesized indications in the Remarks columns specify the areas. (Refer to the cover page for area.)

Parts without these indications can be used for all areas.

*[M] Indicates in Remarks columns parts that are supplied by MESA.

Ref. No.	Part No.	Part Name & Description	Remarks	Ref. No.	Part No.	Part Name & Description	Remarks
		CABINET AND CHASSIS				INTEGRATED CIRCUIT(S)	
1	SNE2129-1	SCREW		IC101	LA1832A	FM/AM IF AMP. AM OSC	
2	RKMO260B-KJ	CABINET	[M]	IC102	LC7218	PLL FREQ SYNTHESIZER	
3	XTBS3+8JFZ1	SCREW		IC401	NJU7312AL	INPUT SELECTOR	
4	REMO020-1	COOLING FAN UNIT		IC402	M5218AP	BUFFER AMP	
4-1	MDN-4RB4MRC	FAN MOTOR		IC451	AN6558-F	PHONO EQ AMP	[M]
4-2	SHE232-1	FAN		IC471	UPC4570C	TONE CONTROL	
4-3	RMQ0209-K	FAN CASE		IC601	RSN3306A	POWER AMP	Δ
4-4	RMQ0208-K	FAN CAP		IC851	BA6218	MOTOR DRIVE	
4-5	SUS271	SPRING		IC901	LC8A012C5756	MICROCOMPUTER	[M]
4-6	RMQ0212-K	FAN TERMINAL CAP		IC902	STK311-010	RDS DECODER	[M]
5	RGR0178B-K1	REAR PANEL	[M] (E)			TRANSISTOR (S)	
5	RGR0178B-J	REAR PANEL	[M] (EG)				
6	RGW0145-1KJ	VOLUME KNOB		Q101	2SC2787L	TRANSISTOR	
7	RFKJAGX190PK	BOTTOM CHASSIS ASS'Y	[M]	Q103, 104	2SC2785FE	TRANSISTOR	
7-1	RKA0053-A	FOOT		Q106	UN411FTA	TRANSISTOR	
8	RKQ0089	P. C. B. SUPPORT		Q107, 108	2SC3311AR	TRANSISTOR	
9	RMCO158-S	TRANSISTOR HOLDER	[M]	Q191-193	2SC3311AR	TRANSISTOR	(E)
10	FWJ1803150QK	FLAT CABLE (3P) (W301)		Q505, 506	2SC3311AR	TRANSISTOR	
11	RFEAGX170EK	CONNECTOR ASS'Y (2P) (W302)		Q509, 510	2SC3327-A	TRANSISTOR	
12	RMNO248-1	FL HOLDER		Q601, 602	2SA1309A-R	TRANSISTOR	
13	RFGAGX280EK	FRONT PANEL ASS'Y	[M]	Q651, 652	2SA1309A-R	TRANSISTOR	
13-1	RKW0317B-Q	TRANSPARENT PLATE	[M]	Q653	2SB621ARTA	TRANSISTOR	Δ
14	RFKNAGX170AK	POWER BUTTON ASS'Y		Q654, 655	2SA1309A-R	TRANSISTOR	
15	RFKNAGX170BK	MODE BUTTON ASS'Y		Q701	2SD2374PQAU	TRANSISTOR	Δ
16	RFKNAGX170CK	SPEAKERS BUTTON ASS'Y		Q703-705	2SC3311AR	TRANSISTOR	Δ
17	RFKNAGX170DK	MUTING BUTTON ASS'Y		Q706	2SC3940AQSTA	TRANSISTOR	Δ
18	RGU1057-K	SELECTOR BUTTON		Q707	2SB1548PQAU	TRANSISTOR	Δ
19	RGW0198-K	BALANCE/TREBLE/BASE KNOB		Q709	2SB1548PQAU	TRANSISTOR	Δ
20	RHD26016	SCREW		Q751	UN421FTA	TRANSISTOR	
21	RHN90001	NUT		Q752	2SC3940AQSTA	TRANSISTOR	Δ
22	XTBS26+8J	SCREW		Q901	RVTDC114YST	TRANSISTOR	
23	SNE2123	GND TERMINAL		Q902	2SA1309A-R	TRANSISTOR	Δ
24	XTB3+20JFZ	SCREW		Q903	RVTDTA144EST	TRANSISTOR	
25	XTB3+8JFZ	SCREW		Q904	RVTDC114YST	TRANSISTOR	
26	XTWS3+8T	SCREW		Q906	2SA1309A-R	TRANSISTOR	
27	XTW3+15T	SCREW		Q907	RVTDC114YST	TRANSISTOR	
28	FWJ1806300KQ	FLAT CABLE (6P) (W701A)		Q908	RVTDC114EST	TRANSISTOR	
29	FWJ1807180KK	FLAT CABLE (7P) (W702)		Q909	2SC3311AR	TRANSISTOR	
30	FWJ1803140KQ	FLAT CABLE (3P) (W651)				DIODE (S)	
31	FWJ1807300KQ	FLAT CABLE (7P) (W701B)					
32	XTBS3+8JFZ1	SCREW		D101	MTZJ5R1BTA	DIODE	Δ
33	XTBS26+8J	SCREW					

Ref. No.	Part No.	Part Name & Description	Remarks	Ref. No.	Part No.	Part Name & Description	Remarks
D102	MA165	DIODE		T701	RTP1N5E014-V	POWER TRANSFORMER (MAIN)	△
D401	MTZJ7R5CTA	DIODE	△	T751	RTP1I5E003-V	POWER TRANSFORMER (SUB)	△
D601, 602	MA165	DIODE				COMPONENT COMBINATION (S)	
D603	MA700	DIODE					
D605, 606	SB360L6508	DIODE		Z101	RLA6Z005M-T	COMPONENT COMBINATION	(E)
D609	MA165	DIODE		Z101	RLA2Z002M-T	COMPONENT COMBINATION	(EG)
D651	MA165	DIODE		Z102	RLI2Z006M-T	COMPONENT COMBINATION	
D652	MTZJ5R6BTA	DIODE		Z891	RCDHC-278N	REMOTE SENSOR	
D653	MA165	DIODE					
D701-704	P300DLF	DIODE	△			FILTER(S) AND OSCILLATOR(S)	
D707, 708	MTZJ6R2BTA	DIODE	△				
D710	MTZJ22DTA	DIODE	△	CF201	RLFFETNGD01L	FILTER	
D712	MTZJ16CTA	DIODE	△	CF202	RLFFETMGD01L	FILTER	
D721-724	P300DLF	DIODE	△	CF901	EFOEC6004T4	OSCILLATOR (6MHz)	
D751-754	1SR35200TB	DIODE	△	CF902	RSXZ456KM07M	OSCILLATOR (456KHz)	
D755	MA165	DIODE		X101	RSXZ456KM07M	OSCILLATOR (456KHz)	
D756	MTZJ6R8CTA	DIODE	△	X102	RLFDGTD01I	OSCILLATOR (10. 65MHz)	
D901	1SS291TA	DIODE		X103	SVQ49U722-S	OSCILLATOR (7. 2MHz)	
D903	MTZJ5R6BTA	DIODE	△				
D904	MA165	DIODE				DISPLAY TUBE (S)	
D917	1SS291TA	DIODE					
D921	MA165	DIODE		FL901	RSL0205-F	DISPLAY TUBE	[M]
D922	MTZJ3R9ATA	DIODE	△				
D923, 924	MA165	DIODE				FM FRONT END PACK ASS'Y(S)	
D927, 928	MA165	DIODE					
D929	LN846RPH	L. E. D.		Z120	ENV17290G1R	FM FRONT END	
D932	MA165	DIODE	(E)				
D933	MA165	DIODE				FUSE (S)	
		VARIABLE RESISTOR(S)		F1	XBA2C16TB0	FUSE, 250V, T1. 6A	△
VR471, 472	EVJYA1FA5C15	TONE CONTROL				SWITCH(ES)	
VR501	EUMWGB025B15	VOLUME CONTROL					
VR502	EVJ02QF02G15	BALANCE CONTROL					
				S950	EVQ21405R	VCR1	
		COIL (S)		S951	EVQ21405R	VCR2	
				S952	EVQ21405R	TAPE/DCC MONITOR	
L101	ELESNR68MA	COIL	(E)	S953	EVQ21405R	CD	
L101	ELESN1ROMA	COIL	(EG)	S954	EVQ21405R	TUNER	
L103	ELEXTR47MA9	COIL		S955	EVQ21405R	PHONO	
L105, 106	RLQZB822KT-D	COIL		S956	EVQ21405R	NUMERIC 0	
L151	SLM1B10-1M	COIL		S957	EVQ21405R	MUTING	
L191	ELESNR68MA	COIL	(E)	S960	EVQ21405R	NUMERIC 1	
L191	ELESNR56MA	COIL	(EG)	S961	EVQ21405R	NUMERIC 2	
L591, 592	RLQZP1R0KT-Y	COIL		S962	EVQ21405R	NUMERIC 3	
L601, 602	RLQYR73M	COIL		S963	EVQ21405R	NUMERIC 4	
L701	SLQZ650MH49	COIL	△	S964	EVQ21405R	NUMERIC 5	
L751	ELESN101KA	COIL		S965	EVQ21405R	NUMERIC 6	
L901, 902	RLQZP101KT-Y	COIL		S966	EVQ21405R	NUMERIC 7	
				S967	EVQ21405R	NUMERIC 8	
		TRANSFORMER (S)		S968	EVQ21405R	NUMERIC 9	
				S970	EVQ21405R	MEMORY	

Ref. No.	Part No.	Part Name & Description	Remarks	Ref. No.	Part No.	Part Name & Description	Remarks
S971	EVQ21405R	FM AUTO/MODE				FUSE HOLDER(S)	
S972	EVQ21405R	BAND					
S973	EVQ21405R	TUNING DOWN		FC701, 702	EYF52BC	FUSE HOLDER	
S974	EVQ21405R	TUNING UP					
S975	EVQ21405R	DIRECT TUNING					
S976	EVQ21405R	SP-B					
S977	EVQ21405R	SP-A					
S978	EVQ21405R	POWER					
		RELAY(S)					
RL601, 602	RSY0013M-0	RELAY	△				
RL751	RSY0019M-0	RELAY	△				
		CONNECTOR(S) AND SOCKET(S)					
CN101, 102	RJU057W007	SOCKET (7P)					
CN301	RJS1A6603	CONNECTOR (3P)					
CN501	RJU003K010M1	SOCKET (10P)					
CN601	RJU057W004	SOCKET (4P)					
CN651	RJS1A6603	CONNECTOR (3P)					
CN701A	RJS1A6606	CONNECTOR (6P)					
CN701B	RJS1A6604	CONNECTOR (4P)					
CN701C	RJS1A6603	CONNECTOR (3P)					
CN710-716	RJS1A1101T1	CONNECTOR (1P)					
CN751	SJS305-1	CONNECTOR (3P)					
CN901-904	RJU003K008M1	SOCKET (8P)					
CP101, 102	RJT057W007-1	CONNECTOR (7P)					
CP501	RJT003K010M1	CONNECTOR (10P)					
CP601	RJT057W004-1	CONNECTOR (4P)					
CP901-904	RJT003K008-1	CONNECTOR (8P)					
		JACK(S) AND TERMINAL(S)					
JK101	RJH4202	ANT TERMINAL					
JK301	SJFK5-1	VCR2 IN TERMINAL					
JK302	SJFD7-6	VIDEO OUT TERMINAL					
JK401	SJF3069N	PHONO/CD TERMINAL					
JK402	SJF3069N	TAPE/DCC TERMINAL					
JK403	SJF3069N	VCR1 TERMINAL					
JK406	RJJ33TR01	REMOTE CONTROL OUT TERMINAL					
JK601	RJR0054	SPEAKERS(A) TERMINAL					
JK602	RJR0054	SPEAKERS(B) TERMINAL					
JK651	RJS1A7402-1	FAN MOTOR TERMINAL					
JK791	SJS9236	AC INLET	△				
HP601	RJJ63TS01	HEADPHONES JACK					
		GND PLATE(S)					
E401	SNE1004-2	GND PLATE					
E601	SNE1004-2	GND PLATE					

RESISTORS AND CAPACITORS

Notes : * Capacity values are in microfarads (uF) unless specified otherwise, P = Pico-farads (pF) F = Farads (F)
 * Resistance values are in ohms, unless specified otherwise, 1 K = 1,000 (OHM), 1 M = 1,000k (OHM)

Ref.No.	Part No.	Values & Remarks	Ref.No.	Part No.	Values & Remarks	Ref.No.	Part No.	Values & Remarks
		RESISTORS						
R103	ERDS2TJ101	1/4W 100	R411-416	ERDS2TJ102	1/4W 1K	R623	ERDS2TJ684	1/4W 680K
R104	ERDS2TJ102	1/4W 1K	R417, 418	ERDS2TJ473	1/4W 47K	R624	ERDS2TJ224T	1/4W 220K
R105	ERDS2TJ471	1/4W 470	R419-422	ERDS2TJ104	1/4W 100K	R625	ERD25FJ220	1/4W 22 Δ
R106	ERDS2TJ224T	1/4W 220K	R423, 424	ERDS2TJ102	1/4W 1K	R626	ERDS2TJ473	1/4W 47K
R107	ERDS2TJ471	1/4W 470	R425-427	ERDS2TJ103	1/4W 10K	R627-630	ERG1SJ101E	1W 100
R110	ERDS2TJ102	1/4W 1K	R440	ERDS1FVJ820T	1/2W 82 Δ	R631, 632	ERDS2TJ223	1/4W 22K
R112	ERDS2TJ104	1/4W 100K	R441, 442	ERDS2TJ473	1/4W 47K	R633, 634	ERDS2TJ103	1/4W 10K
R113	ERDS2TJ103	1/4W 10K	R443	ERDS2TJ330	1/4W 33	R635, 636	ERDS2TJ102	1/4W 1K
R114	ERDS2TJ562	1/4W 5.6K	R451, 452	ERDS2TJ224T	1/4W 220K	R637	ERDS2TJ472	1/4W 4.7K
R115	ERDS2TJ561	1/4W 560	R453, 454	ERDS2TJ391	1/4W 390	R639, 640	ERDS2TJ474	1/4W 470K
R116	ERDS2TJ102	1/4W 1K	R455, 456	ERDS2TJ563	1/4W 56K	R641, 642	ERDS2TJ221	1/4W 220
R117	ERDS2TJ473	1/4W 47K	R457, 458	ERDS2TJ271	1/4W 270	R643, 644	ERDS2TJ154	1/4W 150K
R118	ERDS2TJ562	1/4W 5.6K	R459, 460	ERDS2TJ680T	1/4W 68	R645	ERDS2TJ183T	1/4W 18K
R119	ERDS2TJ183T	1/4W 18K	R461, 462	ERDS2TJ184T	1/4W 180K	R667, 668	ERG1SJ121E	1W 120
R120	ERDS2TJ473	1/4W 47K	R463, 464	ERDS2TJ123	1/4W 12K	R671-674	ERDS2TJ223	1/4W 22K
R121	ERDS2TJ332	1/4W 3.3K	R465, 466	ERDS2TJ563	1/4W 56K	R675	ERDS2TJ682T	1/4W 6.8K
R122	ERDS2TJ272T	1/4W 2.7K	R467-470	ERDS2TJ102	1/4W 1K	R681	ERDS2TJ332	1/4W 3.3K
R124	ERDS2TJ271	1/4W 270	R475, 476	ERDS2TJ471	1/4W 470	R682	ERDS1FVJ220T	1/2W 22 Δ
R125, 126	ERDS2TJ472	1/4W 4.7K	R477-480	ERDS2TJ474	1/4W 470K	R683	ERDS2TJ103	1/4W 10K
R127	ERDS2TJ103	1/4W 10K	R481, 482	ERDS2TJ152	1/4W 1.5K	R684	ERDS2TJ153	1/4W 15K
R128	ERDS2TJ820	1/4W 82	R483, 484	ERDS2TJ392T	1/4W 3.9K	R685, 686	ERDS2TJ333	1/4W 33K
R129	ERDS2TJ473	1/4W 47K	R485, 486	ERDS2TJ223	1/4W 22K	R687	ERDS2TJ103	1/4W 10K
R130, 131	ERDS2TJ102	1/4W 1K	R487, 488	ERDS2TJ392T	1/4W 3.9K	R688	ERDS2TJ222	1/4W 2.2K
R132	ERDS2TJ103	1/4W 10K	R489, 490	ERDS2TJ222	1/4W 2.2K	R689	ERDS2TJ270T	1/4W 27
R133-137	ERDS2TJ102	1/4W 1K	R491, 492	ERDS2TJ122	1/4W 1.2K	R690	ERDS2TJ223	1/4W 22K
R139, 140	ERDS2TJ272T	1/4W 2.7K	R493, 494	ERDS2TJ333	1/4W 33K	R691	ERDS2TJ104	1/4W 100K
R141, 142	ERDS2TJ102	1/4W 1K	R501, 502	ERDS2TJ222	1/4W 2.2K	R692	ERDS2TJ103	1/4W 10K
R143, 144	ERDS2TJ222	1/4W 2.2K	R503, 504	ERDS2TJ103	1/4W 10K	R693	ERDS2TJ223	1/4W 22K
R145, 146	ERDS2TJ102	1/4W 1K (E)	R509-512	ERDS2TJ332	1/4W 3.3K	R694	ERDS2TJ335T	1/4W 3.3M
R145, 146	ERDS2TJ561	1/4W 560 (EG)	R525, 526	ERDS2TJ102	1/4W 1K	R705	ERDS1FVJ688T	1/2W 6.8 Δ
R147, 148	ERDS2TJ474	1/4W 470K	R528	ERDS2TJ822	1/4W 8.2K	R707	ERDS2TJ332	1/4W 3.3K
R149	ERDS2TJ680T	1/4W 68	R529	ERDS2TJ824	1/4W 820K	R708	ERDS2TJ102	1/4W 1K
R171, 172	ERDS2TJ102	1/4W 1K	R532-534	ERDS2TJ102	1/4W 1K	R711	ERD25FVJ221T	1/4W 220 Δ
R173	ERDS2TJ471	1/4W 470	R537	ERDS2TJ102	1/4W 1K	R714	ERDS2TJ472	1/4W 47K
R175	ERDS2TJ102	1/4W 1K	R538	ERDS2TJ472	1/4W 4.7K	R715, 716	ERDS2TJ1R5T	1/4W 1.5
R176	ERDS2TJ391	1/4W 390	R547, 548	ERG1SJ820E	1W 82	R717	ERDS2TJ752T	1/4W 7.5K
R181	ERDS2TJ332	1/4W 3.3K	R591	ERDS1FVJ2R2T	1/2W 2.2 Δ	R718	ERDS2TJ682T	1/4W 6.8K
R191	ERDS2TJ103	1/4W 10K (E)	R601, 602	ERDS2TJ221	1/4W 220	R719	ERDS1FVJ220T	1/2W 22 Δ
R192	ERDS2TJ122	1/4W 1.2K (E)	R603, 604	ERDS2TJ563	1/4W 56K	R721	ERDS2TJ182	1/4W 1.8K
R193	ERDS2TJ182	1/4W 1.8K (E)	R605, 606	ERDS2TJ182	1/4W 1.8K	R723	ERD25FVJ4R7T	1/4W 4.7 Δ
R194	ERDS2TJ122	1/4W 1.2K (E)	R607, 608	ERDS2TJ563	1/4W 56K	R724	ERDS2TJ122	1/4W 1.2K
R195	ERDS2TJ222	1/4W 2.2K (E)	R609, 610	ERDS2TJ100	1/4W 10	R727	ERD25FVJ180T	1/4W 18 Δ
R375, 376	ERDS2TJ102	1/4W 1K	R611, 612	ERDS1FVJ100T	1/2W 10 Δ	R728	ERDS1FVJ100T	1/2W 10 Δ
R377, 378	ERDS2TJ223	1/4W 22K	R613, 614	ERDS2TJ102	1/4W 1K	R729	ERDS2TJ152	1/4W 1.5K
R401, 402	ERDS2TJ102	1/4W 1K	R615	ERDS2TJ184T	1/4W 180K	R754	ERDS2TJ102	1/4W 1K
R405-408	ERDS2TJ102	1/4W 1K	R616	ERDS2TJ154	1/4W 150K	R901	ERDS2TJ102	1/4W 1K
			R619	ERDS2TJ684	1/4W 680K	R902	ERDS2TJ681	1/4W 680
			R620	ERDS2TJ473	1/4W 47K	R907-911	ERDS2TJ104	1/4W 100K
			R621, 622	ERD25FVJ180T	1/4W 18 Δ	R912	ERDS2TJ102	1/4W 1K

Ref. No.	Part No.	Values & Remarks	Ref. No.	Part No.	Values & Remarks	Ref. No.	Part No.	Values & Remarks
R913	ERDS2TJ104	1/4W 100K	C111	ECEA1EKA4R7B	25V 4.7U	C440	ECBT1E103ZF	25V 0.01U
R920	ERDS2TJ271	1/4W 270	C112	ECBT1C103NS5	16V 0.01U	C451, 452	ECEA1VKA4R7B	35V 4.7U
R921	ERDS2EJ121	1/4W 120	C113	ECBT1H102KB5	50V 1000P	C453, 454	ECBT1H100JC5	50V 10P
R922	ERDS2TJ472	1/4W 4.7K	C114	ECEA1HKA3R3B	50V 3.3U	C455, 456	ECBT1H102KB5	50V 1000P
R923	ERDS2TJ102	1/4W 1K	C115	ECEA1EKA4R7B	25V 4.7U	C457, 458	ECEA1AKA330B	10V 33U
R924	ERDS2TJ333	1/4W 33K	C116	ECBT1C822MS5	16V 8200P	C459, 460	ECFR1E223KR	25V 0.022U
R925	ERDS2TJ472	1/4W 4.7K	C117	ECQB1H471JF3	50V 470P	C461, 462	ECFR1E682KR	25V 6800P
R926	ERDS2TJ122	1/4W 1.2K	C118, 119	ECQB1H103JF3	50V 0.01U	C463, 464	ECEA1VKA4R7B	35V 4.7U
R927	ERDS2TJ181T	1/4W 180	C120, 121	ECEA1HKA010B	50V 1U	C465, 466	ECBT1E103ZF	25V 0.01U
R928	ERDS2TJ222	1/4W 2.2K	C122	ECEA1HKA2R2B	50V 2.2U	C469, 470	ECBT1H181KB5	50V 180P
R929	ERDS2TJ562	1/4W 5.6K	C123	ECEA1HKA010B	50V 1U	C471, 472	ECEA1HKA3R3B	50V 3.3U
R930, 931	ERDS2TJ101	1/4W 100	C124	ECBT1H102KB5	50V 1000P	C475, 476	ECBT1H150J5	50V 15P
R932-940	ERDS2TJ102	1/4W 1K	C125	ECBT1H150JC5	50V 15P	C477, 478	ECBT1H221KB5	50V 220P
R941	ERDS2TJ472	1/4W 4.7K	C126	ECBT1H104ZF5	50V 0.1U	C479, 480	ECBT1H560J5	50V 56P
R946-948	ERDS2TJ103	1/4W 10K	C127	ECEA1CKA220B	16V 22U	C481-484	ECEA1VKA4R7B	35V 4.7U
R949	ERDS2TJ104	1/4W 100K	C128	ECBT1C103NS5	16V 0.01U	C485, 486	ECFR1E123KR	25V 0.012U
R950	ERDS2TJ102	1/4W 1K	C129, 130	ECEA0JKA101B	6.3V 100U	C487, 488	ECQV1H683JZ3	50V 0.068U
R951	ERDS2TJ122	1/4W 1.2K	C131	ECBT1C103NS5	16V 0.01U	C489, 490	ECBT1C562KR5	16V 5600P
R952	ERDS2TJ152	1/4W 1.5K	C132	ECBT1H102KB5	50V 1000P	C491, 492	ECFR1E273KR	25V 0.027U
R953	ERDS2TJ182	1/4W 1.8K	C133	ECBT1H150JC5	50V 15P	C495, 496	ECBT1E103ZF	25V 0.01U
R954	ERDS2TJ222	1/4W 2.2K	C134	ECBT1H180JC5	50V 18P	C503, 504	ECEA1VKA4R7B	35V 4.7U
R955	ERDS2TJ332	1/4W 3.3K	C135, 136	ECBT1C103MS5	16V 0.01U	C518	ECEA1HKN010B	50V 1U
R956	ERDS2TJ472	1/4W 4.7K	C137, 138	ECBT1H561KB5	50V 560P	C541, 542	ECEA1HN100SB	50V 10U
R960	ERDS2TJ102	1/4W 1K	C139, 140	ECQB1H682JF3	50V 6800P	C543, 544	ECBT1C332KR5	16V 3300P
R961	ERDS2TJ122	1/4W 1.2K	C141-144	ECEA1HKA010B	50V 1U	C591, 592	ECEA0JKA101B	6.3V 100U
R962	ERDS2TJ152	1/4W 1.5K	C145	ECBT1H220JC5	50V 22P	C593, 594	ECFR1E104KR	25V 0.1U
R963	ERDS2TJ182	1/4W 1.8K	C146	ECBT1H331KB5	50V 330P	C595	ECBT1E103ZF	25V 0.01U
R964	ERDS2TJ222	1/4W 2.2K	C147	ECBT1H102KB5	50V 1000P	C601, 602	ECEA1HKN2R2B	50V 2.2U
R965	ERDS2TJ332	1/4W 3.3K	C148, 149	ECBT1C103NS5	16V 0.01U	C603, 604	ECBT1H561KB5	50V 560P
R966	ERDS2TJ472	1/4W 4.7K	C150	ECBT1H104ZF5	50V 0.1U	C605, 606	ECA1JM330B	63V 33U
R967	ERDS2TJ682T	1/4W 6.8K	C172	ECBT1H331KB5	50V 330P	C607, 608	ECCR1H100K5	50V 10P
R970	ERDS2TJ102	1/4W 1K	C173	ECEA1CKA220B	16V 22U	C609, 610	ECBT1H151KB5	50V 150P
R971	ERDS2TJ122	1/4W 1.2K	C174	ECEA1CKA101B	16V 100U	C611, 612	ECQV1H473JZ3	50V 0.047U
R972	ERDS2TJ152	1/4W 1.5K	C175, 176	ECBT1C103NS5	16V 0.01U	C613, 614	ECBA1H681KB5	50V 680P
R973	ERDS2TJ182	1/4W 1.8K	C181	ECBT1H471KB5	50V 470P	C615	ECEA2AN2R2SB	100V 2.2U

Ref. No.	Part No.	Values & Remarks	Ref. No.	Part No.	Values & Remarks	Ref. No.	Part No.	Values & Remarks
C708	ECKR1H103ZF5	50V 0.01U	C753	ECA1EM102B	25V 1000U Δ	C908	ECBT1E103ZF	25V 0.01U
C709	ECEA1CKA330B	16V 33U	C756	ECBT1E103ZF	25V 0.01U	C911, 912	ECEA2AU100	100V 10U
C710	ECBT1E103ZF	25V 0.01U	C757	ECEA1CKA470B	16V 47U	C913, 914	ECEA1VKA100B	35V 10U
C711	ECKR1H103ZF5	50V 0.01U	C758	ECEA1KA101B	10V 100U	C916	ECEA1HKA010B	50V 1U
C712	ECA1HM470B	50V 47U	C759	ECEA1EKA220B	25V 22U	C917	ECEA1HKAR47B	50V 0.47U
C713	ECKR1H103ZF5	50V 0.01U	C891	ECFR1E392KR	25V 3900P	C918	ECEA0JKA221B	6.3V 220U
C716	ECEA2AU100	100V 10U	C901	ECA0JM102B	6.3V 1000U	C919	ECBT1H331KB5	50V 330P
C720	ECEA1EKA220B	25V 22U	C902	ECBT0J223MS5	6.3V 0.022U	C920	ECEA1HKA010B	50V 1U
C722	ECQE2104KF3	250V 0.1U	C903	ECBT1E103ZF	25V 0.01U	C921-928	ECBT1H331KB5	50V 330P
C751	ECKWNS102MBM	400V 1000P Δ	C904	ECA0JM471B	6.3V 470U	C929-932	ECBT1H01KB5	50V 100P
C752	ECKR1H103ZF5	50V 0.01U	C906	ECEA0JKA101B	6.3V 100U	C933	ECBT1E103ZF	25V 0.01U

REPLACEMENT PARTS LIST

Notes: *Important safety notice:

Components identified by Δ mark have special characteristics important for safety.

Furthermore, special parts which have purposes of fire-retardant (resistors), high-quality sound (capacitors), low-noise (resistors), etc. are used.

When replacing any of components, be sure to use only manufacturer's specified parts shown in the parts list.

*The parenthesized indications in the Remarks columns specify the areas. (Refer to the cover page for area.)

Parts without these indications can be used for all areas.

*[M] Indicates in Remarks columns parts that are supplied by MESA.

*The "(SF)" mark denotes the standard part.

Ref. No.	Part No.	Part Name & Description	Remarks	Ref. No.	Part No.	Part Name & Description	Remarks
				A5-1	RMN0244	AM ANTENNA HOLDER	
		PACKING MATERIAL		A5-2	XTN3+12AFZ	SCREW	
				A6	SSA270M	FM INDOOR ANTENNA	
P1	RPG2584	PACKING CASE	[M]	A7	EUR643861	REMOTE CONTROL TRANSMITTER	[M]
P2	RPN0865	CUSHION	[M]	A7-1	UR64EC1371	BATTERY COVER	FOR R/C TRANSMITTER
P3	RPNX0047	POLYFORM PAD	[M]				
P4	SPSD152	ACCESSORIES BOX				<GREASE OR JIG/TOOL>	
P5	XZB24X33C04	PROTECTION BAG (F. B.)				GREASE	
P6	RPFX0005	PROTECTION BAG (UNIT)	[M]				
				SA1	RFXK0002	COMPOUND GREASE	
		ACCESSORIES					
						TEST DISC	
A1	RFKSAGX180E	INSTRUCTION MANUAL ASS'Y	[M] (E)				
A1	RFKSAGX180EG	INSTRUCTION MANUAL ASS'Y	[M] (EG)	SA2	SZZP1054C	UNEVEN TEST DISC	
A2	RJA0019-2K	AC POWER SUPPLY CORD	Δ (SF)				
A3	RQA0013	WARRANTY CARD				TEST TAPE	
A4	RQCB0169	SERVICENTER LIST					
A5	RSA0010	AM LOOP ANTENNA SET		SA3	QZZCLA	DISTORTION ADJUSTMENT	

■ PACKAGING

